98-84384-9

Suburban Transit Engineering Board...

Progress report of the Suburban Transit...

[New York?]

[1930]

98-84384-9
MASTER NEGATIVE #

COLUMBIA UNIVERSITY LIBRARIES
PRESERVATION DIVISION

BIBLIOGRAPHIC MICROFORM TARGET

ORIGINAL MATERIAL AS FILMED - EXISTING BIBLIOGRAPHIC RECORD

HD
540
Sul7 Suburban transit engineering board of the Metropolitan district.
Progress report...
1929/30-
[New York, 1930-
v. illus., maps, tables, diagrs. 23cm.

Cover-title: 1929/30 Progress report on suburban transit for the metropolitan district of New York.
Planographed.

RESTRICTIONS ON USE: Reproductions may not be made without permission from Columbia University Libraries.

TECHNICAL MICROFORM DATA

FILM SIZE: 35mm REDUCTION RATIO: 11:1 IMAGE PLACEMENT: IA (IIA) IB IIB

DATE FILMED: 4-3-98 INITIALS: PB

TRACKING # : 31330

FILMED BY PRESERVATION RESOURCES, BETHLEHEM, PA.

BIBLIOGRAPHIC IRREGULARITIES

MAIN ENTRY: Suburban Transit Engineering Board of the Metropolitan District (New York, N.Y.)

Progress report of the Suburban Transit Engineering Board of the Metropolitan District

Bibliographic Irregularities in the Original Document:

List all volumes and pages affected; include name of institution if filming borrowed text.

__X__ Page(s) missing/not available: front cover

_____ Volume(s) missing/not available: _____

_____ Illegible and/or damaged page(s): _____

_____

_____ Page(s) or volume(s) misnumbered: _____

_____ Bound out of sequence: _____

_____ Page(s) or volume(s) filmed from copy borrowed from: _____

_____

_____ Other: _____

_____

_____ Inserted material: _____

TRACKING#: MSH31330

PROGRESS REPORT

of the

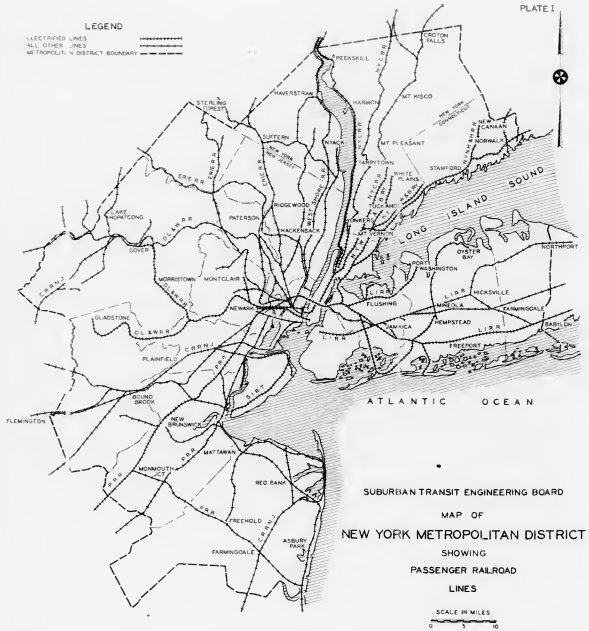
SUBURBAN TRANSIT ENGINEERING BOARD

OF THE METROPOLITAN DISTRICT

* * * * * *

March 25, 1930

PLATE I



SUBURBAN TRANSIT ENGINEERING BOARD

MAP OF

NEW YORK METROPOLITAN DISTRICT

SHOWING

PASSENGER RAILROAD

LINES

SCALE IN MILES

0 5 10

CONTENTS

Page

SUBURBAN TRANSIT ENGINEERING BOARD

Representatives on the Board - - - - - - - - - - - - - - - - - - viii
Planning Committees - ix
Letter of Transmittal - x
Organization of the Board - - - - - - - - - - - - - - - - - - - 1
Financing the Studies - 2
Plan and Scope - 3

THE SUBURBAN PASSENGER CENSUS OF 1927

The Census and Why Taken - - - - - - - - - - - - - - - - - - - 7
The Organization of the 1927 Census - - - - - - - - - - - - - - 7
The Distribution and Collection of Cards - - - - - - - - - - - - 8
Coding and Sorting the Cards - - - - - - - - - - - - - - - - - 8
October 26th a Typical Traffic Day - - - - - - - - - - - - - - 9
Daily Inbound Railroad Passengers - - - - - - - - - - - - - - - 9
Those Passengers Who Did Not Enter Manhattan - - - - - - - - - 9
Points of Origin of Traffic in the Suburban Sectors - - - - - - 9
Annular Zone Distribution from New York Terminals - - - - - - - 11
Average Length of Suburban Passenger Ride - - - - - - - - - - - 11
Facilities Used by Inbound Passengers to Reach Their
Railroad Station - 11
Types of Tickets Used by the Suburban Passengers - - - - - - - - 13
Hourly Passenger Loads on New York Terminals - - - - - - - - - - 13
Destinations - 13
Destination of Passengers from the Principal Terminals - - - - 19
Local Transit Facilities Used by Railroad Passengers
in Manhattan - 20

SOME COMPARISONS OF SUBURBAN RAILROAD TRAFFIC IN THE NEW JERSEY, WESTCHESTER AND LONG ISLAND SECTORS

Suburban Railroad Passengers Not Entering New York City - - - - 21
Maximum Sixty Minute Passenger Density at Terminals - - - - - - 21
Destinations - 23
Local Transit Facilities Used in New York City - - - - - - - - 23

GROWTH OF TOTAL ANNUAL PASSENGER TRAFFIC IN THE NEW YORK METROPOLITAN DISTRICT

Growth of Total Annual Passenger Traffic - - - - - - - - - - - 27

SURVEY OF SUBURBAN PASSENGER ROLLING EQUIPMENT

Wide Range in Sizes of Suburban Equipment - - - - - - - - - - - 33
Motive Power of the Suburban Railroads - - - - - - - - - - - - 35
Determination of a Tentative Tunnel Diameter - - - - - - - - - 37

C O N T E N T S - Continued

Page

PROGRESS IN THE DEVELOPMENT OF THE COMPREHENSIVE CO-ORDINATED SUBURBAN TRANSIT PLAN

New Jersey Sector - 41
Westchester Sector - 43
Long Island Sector - 45
A Suggested Solution for Traffic Relief - - - - - - - - - - - - 45
Use of Existing Track - 45
Studies Made in Relation to a Suburban Transit System - - - 47
Jamaica - 47
Winfield Junction - 47
Queens-Manhattan Connection - - - - - - - - - - - - - - - - - 47
Flatbush Avenue, Brooklyn-Lower Manhattan Connection - - 47
Stations - 49
Traffic, Construction and Operating Costs - - - - - - - - 49

L I S T O F I L L U S T R A T I O N S

Plate

Frontispiece - Passenger Railroads in New York Metropolitan District - - - - - - - - - - - - I

Westchester and Long Island Sectors - - - - - - - - - - - - - - - II

Sample Census Card - III

Railroad Terminals - New York City and Vicinity - - - - - - - - - IV

Proportion of Total Suburban Traffic in Relation to Distance of Origin from Terminals - - - - - - V

Types of Railroad Tickets Used by Inbound Suburban Passengers - - VI

Daily Inbound Passengers Arriving Each Half Hour at Grand Central Terminal - - - - - - - - - - - VII

Daily Inbound Passengers Arriving Each Hour Hour at Three Long Island Railroad Terminals - - - - VIII

Daily Inbound Passengers Arriving Each Half Hour at Sedgwick Avenue and Harlem River-180th Street IX

Manhattan Destination Zones - - - - - - - - - - - - - - - - - - X

Daily Destination Zones in Manhattan - All Suburban Sectors - - - XI

Facilities Used by Suburban Passengers After Leaving Terminals - XII

Total Railroad Passengers in the New York Metropolitan District - XIII

Growth of Total Railroad Traffic, New York Metropolitan District, Increase of Each Year Over Its Preceding Year XIV

C O N T E N T S - Continued

Plate

Comparative Changes in Volume of Passenger Traffic, U. S. Class I Railroads - - - - - - - - - - - - - XV

Comparison of Growth of Railroad Passengers, Population, and Registration of Passenger Automobiles in U. S. A. XVI

Some Types of Passenger Cars Used in New York Metropolitan District - - - - - - - - - - - - - - XVII

Overall Height of Equipment of Passenger Railroads, New York Metropolitan District - - - - - - - - - XVIII

Electrified Passenger Railroad Lines, New York Metropolitan District - - - - - - - - - - XIX

Comparison of Subaqueous Tube Sizes - - - - - - - - - - - - - - - XX

Suburban Transit Studies - XXI

Existing Long Island Railroad Lines Used for Suburban Service - - XXII

Proposed Route of Suburban Transit System West of Jamaica - - - XXIII

Alternative Routes Suggested Between Manhattan and Sunnyside Yard, Queens - - - - - - - - - - - - XXIV

Alternative Routes Suggested Between Manhattan and the Long Island Railroad Flatbush Avenue Station - - - XXV

A P P E N D I X A

Table

TRAFFIC TABLES - SUBURBAN PASSENGER CENSUS, OCTOBER 26, 1927

Total Daily Inbound Railroad Passengers, Classified by Sectors and Railroads - - - - - - - - - - - - - - - I

Total Daily Inbound Railroad Passengers, Classified by Terminals II

Relation of Suburban Railroad Traffic to Metropolitan Area, Classified by Sectors, Railroads and Terminals - - III

Annual Zone Distribution from New York City Terminals, Classified by Sectors, Railroads and Terminals - - IV

Facilities Used by Daily Inbound Suburban Passengers to Reach Their Railroad Boarding Station - Classified by Sectors, Railroads, Divisions and Branches - - - - V

Types of Railroad Tickets Used, Classified by Sectors, Railroads and Terminals - - - - - - - - - VI

C O N T E N T S - Continued

	Table
Hal'-Hourly Passenger Load on New York City Terminals, Classified by Sectors	VII
Hal'-Hourly Passenger Load on New York City Terminals, Classified by Railroads	VIII
Hal'-Hourly Passenger Load on New York City Terminals, Classified by Terminals	IX
Ultimate Destination of Daily Inbound Suburban Passengers, Classified by Sectors, Railroads and Terminals	X
Daily Inbound Terminal Passengers, Classified as to Destination in Manhattan and Elsewhere - Sectors, Railroads and Terminals	XI
Destination Zones of Manhattan-Bound Passengers, Classified by Sectors	XII
Destination Zones of Manhattan-Bound Passengers, Classified by Railroads	XIII
Destination Zones of Manhattan-Bound Passengers, Classified by Terminals	XIV
Facilities Used from Railroad Terminals, Classified by Sectors, Railroads and Terminals	XV
Facilities Used from Railroad Terminals, Classified According to Location Below Street Level, At Street Level, and Above Street Level	XVI
Maximum 60 Minute Passenger Load on Railroad Terminals, New Jersey Sector	XVII
Maximum 60 Minute Passenger Load on New York City Terminals Westchester and Long Island Sectors	XVIII

C O N T E N T S - Continued

	Table
A P P E N D I X B	
ANNUAL TRAFFIC TABLES	
Growth of Suburban Railroad Traffic - Combined New Jersey, Westchester and Long Island Sectors	XIX
Growth of Suburban Railroad Traffic Carried To and From New York City - Classified by Sectors	XX
Comparative Changes in Volume of Passenger Traffic, Total Class I Railroads of the United States, and Passenger Railroads of the New York Metropolitan Area	XXI
Comparison of Growth of Railroad Passengers, Population and Registrations of Passenger Automobiles in the U. S. A.	XXII

SUBURBAN TRANSIT ENGINEERING BOARD

of the Metropolitan District

* * * * *

Representatives

New Jersey Sector
North Jersey Transit Commission of the State of New Jersey
DANIEL L. TURNER, Consulting Engineer

Westchester Sector
Board of Supervisors - Westchester County
CHAS. MAC DONALD, County Engineer

Long Island Sector
Boards of Supervisors - Nassau and Suffolk Counties
W. FRED. STARKS, County Engineer, Nassau County
ALBERT O. SMITH, County Supt. of Highways, Suffolk County

City of New York
Board of Transportation of the City of New York
ROBERT RIDGWAY, Chief Engineer

The Port of New York District
The Port of New York Authority
BILLINGS WILSON, Deputy Manager

Railroads
Association of Railroad Executives:

R. E. DOUGHERTY, Vice President, N. Y. C. Lines
Representing: New York Central Railroad
New York, Ontario & Western Railroad

R. C. FALCONER, Assistant Vice President, Erie R. R.
Representing: Erie Railroad

A. E. OWEN, Chief Engineer, C. R. R. of N. J.
Representing: Central Railroad of New Jersey
Baltimore & Ohio Railroad

J. F. PATTERSON, General Manager, New York Zone, Penna. R. R.
Representing: Pennsylvania Railroad
Long Island Railroad
Lehigh Valley Railroad

G. J. RAY, Chief Engineer, D. L. & W. R. R.
Representing: Delaware, Lackawanna & Western Railroad

C. E. SMITH, Vice President, N. Y. N. H. & H. R. R.
Representing: New York, New Haven & Hartford Railroad

Officers

Daniel L. Turner Chairman	Glenn S. Reeves, Secretary 75 West Street New York City.	Billings Wilson Vice Chairman

PLANNING COMMITTEES

New Jersey Sector Planning Committee

R. C. Falconer, Chairman	#G. J. Ray
R. E. Dougherty	Billings Wilson
#A. E. Owen	Daniel L. Turner
¢J. F. Patterson	Glenn S. Reeves

Westchester Sector Planning Committee

*R. E. Dougherty, Chairman	Billings Wilson
*H. M. Brinckerhoff	Daniel L. Turner
Chas. MacDonald	Glenn S. Reeves
#C. E. Smith	

Long Island Sector Planning Committee

¢J. F. Patterson, Chairman	Billings Wilson
Robert Ridgway	Daniel L. Turner
Albert O. Smith	Glenn S. Reeves
W. Fred. Starks	

Standard Equipment Committee

#G. J. Ray, Chairman@	¢J. F. Patterson
R. E. Dougherty@	#C. E. Smith
R. C. Falconer	Daniel L. Turner
#A. E. Owen	Glenn S. Reeves

*Mr. H. M. Brinckerhoff resigned as Chairman of the Westchester Sector Planning Committee on December 30, 1929.
*Mr. R. E. Dougherty appointed Chairman of this Committee on January 8, 1930.
¢Mr. J. F. Patterson succeeded Mr. R. K. Rochester February 1, 1929.
#Appointed members of the Board September 27, 1929.
@Mr. R. E. Dougherty resigned as Chairman of the Standard Equipment Committee on January 8, 1930.
@Mr. G. J. Ray appointed Chairman of this Committee January 10, 1930.

DANIEL L. TURNER, CHAIRMAN BILLINGS WILSON, VICE CHAIRMAN

SUBURBAN TRANSIT ENGINEERING BOARD
OF THE METROPOLITAN DISTRICT

REPRESENTATIVES
NORTH JERSEY TRANSIT COMMISSION
DANIEL L. TURNER, CONSULTING ENGINEER
THE PORT OF NEW YORK AUTHORITY
BILLINGS WILSON, DEPUTY MANAGER
BOARD OF TRANSPORTATION, NEW YORK CITY
ROBERT RIDGWAY, CHIEF ENGINEER
WESTCHESTER COUNTY
CHAS. MACDONALD, COUNTY ENGINEER
NASSAU COUNTY
W. FRED J. STARKS, COUNTY ENGINEER
SUFFOLK COUNTY
ALBERT O. SMITH, COUNTY SUPT. OF HIGHWAYS

GLENN S. REEVES, SECRETARY
79 WEST 87 STREET
NEW YORK CITY

REPRESENTATIVES
NEW YORK CENTRAL RAILROAD
R. E. DOUGHERTY, ENGINEERING ASST. TO PRESIDENT
ERIE RAILROAD
R. C. FALCONER, ASSISTANT VICE PRESIDENT
CENTRAL RAILROAD OF NEW JERSEY
A. E. OWEN, CHIEF ENGINEER
PENNSYLVANIA RAILROAD
J. F. PATTERSON, GENERAL MANAGER, NEW YORK ZONE
DELAWARE, LACKAWANNA & WESTERN RAILROAD
G. J. RAY, CHIEF ENGINEER
NEW YORK, NEW HAVEN & HARTFORD RAILROAD
C. E. SMITH, VICE PRESIDENT

March 25, 1930.

To the

North Jersey Transit Commission of the State of New Jersey,
Board of Supervisors, Westchester County,
Board of Supervisors, Nassau County,
Board of Supervisors, Suffolk County,
Board of Transportation of the City of New York,
Association of Railroad Executives,
The Port of New York Authority,

Comprising

The Associated Suburban Transit Agencies
of the Metropolitan District:

By direction of the Suburban Transit Engineering Board of the Metropolitan District, at its meeting today, I am transmitting herewith its Report of Progress in developing a comprehensive suburban transit plan.

Respectfully submitted,

GLENN S. REEVES,
Secretary.

Mr. C. E. Smith Vice President New York New Haven and Hartford Railroad does not concur in this report.

P R E F A C E

The Suburban Transit Engineering Board has made progress in its endeavor to work out a comprehensive plan for handling the passenger traffic which originates outside of the New York City boundaries and referred to as the suburban commuter passenger traffic.

The purpose of this report is to set forth the facts relating to the movement of suburban passengers, the engineering obstacles to be overcome, including those relating to the different sizes and types of equipment and motive power, and to present some idea of what the various planning committees on the Board have been able to accomplish toward the development of a comprehensive, co-ordinated suburban transit plan for the entire district. All plans in this report are shown only to indicate the progress of studies. No consideration has been given to the legal, financial or operating problems, nor as to how or by what agency any of the facilities would be provided, financed or operated.

Organization of the Board.

Since the last report (January 11, 1928) there have been changes in the personnel, but no change in the agencies comprising the Board. Mr. J. F. Patterson, General Manager, New York Zone, Pennsylvania Railroad, has succeeded Mr. R. K. Rochester as the Pennsylvania Railroad representative. Mr. A. E. Owen, Chief Engineer, Central Railroad of New Jersey, Mr. C. J. Ray, Chief Engineer, Delaware, Lackawanna & Western Railroad, and Mr. C. E. Smith, Vice President, New York, New Haven & Hartford Railroad, have been named as additional representatives of the Association of Railroad Executives.

During the absence of Mr. Daniel L. Turner, Chairman, the representative of the North Jersey Transit Commission, Mr. S. B. Farnum, Commissioner, has been acting for that Commission.

In addition to the members of the Board, Mr. Henry M. Brinckerhoff has given freely of his time and advice as a member of the Westchester Planning Committee.

As a matter of practical organization, the representatives on the Board have been divided into sector planning committees to prepare the necessary physical plan for their respective sectors. The Secretary of the Board is a member of all of these committees and director of the entire staff assigned to work on suburban transit studies. The Chairman also serves as an ex-officio member of all committees.

The personnel of the sector planning committees will be found on page IX.

Financing the Studies.

The Suburban Transit Engineering Board has no funds of its own. The staff for conducting studies, research investigations, analyses, preparation of plans and reports, is furnished by the various agencies represented on the Board.

SOURCES OF STAFF AND PROPORTIONAL EXPENSES

(Fiscal Year July 1, 1929, to June 30, 1930)

	Personnel Number	Personnel Percent	Total Salaries	Total Expenses
Port Authority	9	43%	49%	53.5%
Railroads	7	33	35	32.0
Board of Transportation	3	14	14	13.0
North Jersey Transit Commission	1	5	1	1.0
Westchester County	1*	5*	1*	0.5*
	21	100%	100%	100.0%

*Represents 2½ months.

For the first year of its existence all the necessary funds were furnished by The Port of New York Authority and the North Jersey Transit Commission. Since July 1, 1928, the staff has been augmented by other agencies represented on the Board who have assigned members from their own staffs to work under the direction and in the office of the Secretary of the Board. Were it not for this financial assistance and the close co-operation on the part of the agencies in assigning properly qualified members of their respective staffs it would have been impossible to maintain a well balanced staff to carry on the suburban transit studies required by the various sector planning committees.

The following table indicates the source of this personnel and the proportional expenses borne by the member agencies since the organization of the Board.

TOTAL EXPENDITURES - SUBURBAN TRANSIT STUDIES

Fiscal Year Ending	Port Authority Amount	Port Authority % of Total	Other Agencies Amount	Other Agencies % of Total	Total
June 30, 1928	$38,879.53	59.5%	$26,500.00*	40.5%	$65,379.53
June 30, 1929	44,830.90	65.0%	24,200.27#/	35.0%	69,031.17
June 30, 1930 (Estimated)	40,000.00	53.5%	40,000.00&	46.5%	86,000.00

NUMBER OF EMPLOYEES - SUBURBAN TRANSIT STUDIES

June 30, 1928	11	61.1%	7*	38.9%	18
June 30, 1929	11	52.5%	10#	47.5%	21
June 30, 1930	9	43.0%	12&	57.0%	21

*Funds and employees furnished by North Jersey Transit Commission.
#Salaries and employees furnished by North Jersey Transit Commission, Board of Transportation, and the Railroads.
/Represents expenditures for only about 9½ months for each agency.
&Salaries and employees furnished by North Jersey Transit Commission, Board of Transportation, Westchester County and the Railroads.

Plan and Scope.

The planning autonomy of the various local agencies represented on the Suburban Transit Engineering Board has been recognized in their respective sectors. The studies of this Board have been toward developing a comprehensive plan to facilitate the easy movement of suburban passengers to and through the centers of the Metropolitan District and not toward the development of transit facilities for the intra community passengers, the latter being a function of the local authorities.

For the purpose of the work of this Board, a suburban transit rider, as distinct from an intra city rider, has been defined to be a passenger using suburban trains, steam or electric. In other words, an intra city rider, using local community transportation facilities, surface, subway or elevated, is not to be considered as a commuter.

At one of the early meetings of the Board the plan and general scope of the work of the Board was embodied in a resolution as follows:

Major Premise:

> To prepare a comprehensive engineering, legal and financial plan for supplying adequate suburban and interurban passenger transportation between all sections of the New York Metropolitan District, including the suburban districts in both the States of New York and New Jersey.
>
> In working out such a general and inclusive plan for the whole Metropolitan District, due regard should be given to the local plans of the several districts where studies have been made and plans adopted.

Minor Premises:

(1) The Associated Suburban Transit Agencies of the Metropolitan District shall consist of the Public Agencies and Railroads who are co-operating in this study.

(2) The Suburban Transit Engineering Board shall consist of the engineering, or other designated representatives of the aforementioned groups.

(3) The Suburban Transit Engineering Board shall co-ordinate the plans of the several agencies and in co-operation with such agencies shall prepare a physically practical engineering plan with supporting estimates of capital and operating costs and suggestions as to method of operating and financing, for submission to the Associated Suburban Transit Agencies as a basis for preparation of the legal and financial aspects of the enlarged comprehensive plan.

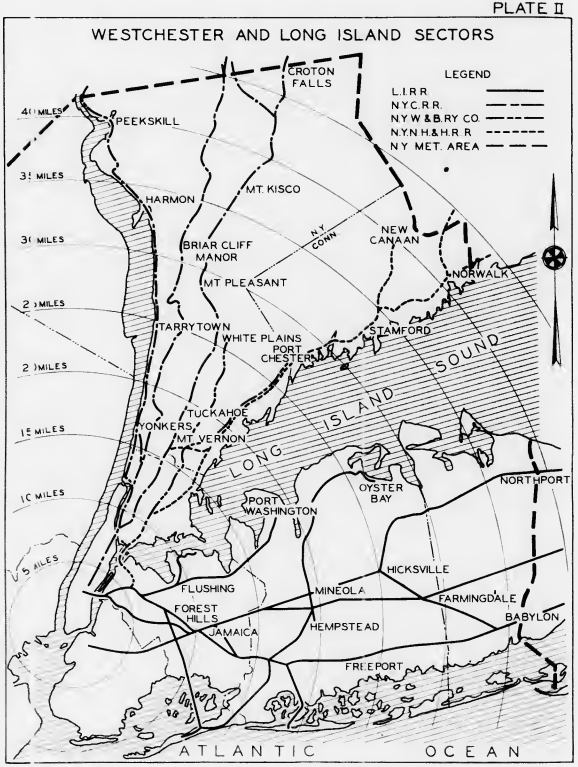
FACTS RELATING TO THE MOVEMENT OF SUBURBAN PASSENGERS

As Indicated by the

SUBURBAN PASSENGER CENSUS OF 1927

In the Westchester and Long Island Sectors

PLATE II



SUBURBAN PASSENGER CENSUS OF 1927

Westchester and Long Island Sectors

The Census and Why Taken.

Information concerning the origin and destination of Manhattan-bound passengers on suburban trains on all railroads in the Westchester and Long Island suburban areas was obtained through the aid of the passengers themselves. The collection of this information was made during a twenty-four hour period beginning at midnight Tuesday, October 25th, and ending at midnight Wednesday, October 26, 1927.

The North Jersey Transit Commission had previously taken a similar census of suburban railroad traffic in Metropolitan New Jersey for a twenty-four hour period on September 24, 1924. The results secured in the New Jersey census were of tremendous value in subsequent planning work.

The census of 1927 was taken to ascertain the facts regarding not only the origin and destination of the suburban passenger, but also other characteristic travel habits and the extent to which the suburbanite is dependent, after leaving the suburban railroad terminal, upon the city transportation facilities to reach the ultimate destination in New York City.

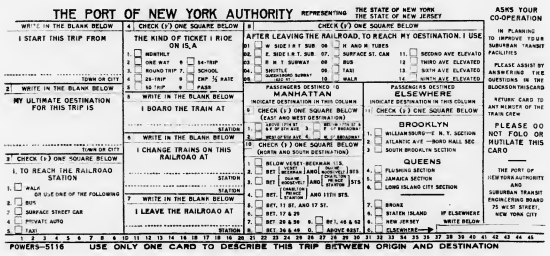
The Organization of the 1927 Census.

The Port of New York Authority, together with the Suburban Transit Engineering Board, sponsored the organization and direction of the forces necessary in taking the 1927 census. The metropolitan newspapers, as well as papers of the local communities, in advance of the census date carried numerous articles stating the purpose of such a census and asking the riding public to co-operate by checking on the card the information requested. In addition to this newspaper publicity, railroad station posters were placed in stations within a 50 mile zone from Manhattan, and handbills containing an explanation and a reproduction of the census card were distributed on outbound trains during the evening rush hour of the day prior to the census.

On the day of the census more than two hundred persons, supplied from civic organizations and the various departments of the agencies represented on the Board, in addition to the regular railroad train crews, served in the distribution and collection of the cards.

The Distribution and Collection of Cards.

The count was taken by means of printed census cards about the size of an ordinary letter envelope. A copy of the card appears below.


THE PORT OF NEW YORK AUTHORITY REPRESENTING THE STATE OF NEW YORK THE STATE OF NEW JERSEY

ASKS YOUR CO-OPERATION

IN PLANNING TO IMPROVE YOUR SUBURBAN TRANSIT FACILITIES

PLEASE ASSIST BY ANSWERING THE QUESTIONS ON THE BLOCKED PORTION OF THIS CARD

RETURN CARD TO ANY MEMBER OF THE TRAIN CREW

PLEASE DO NOT FOLD OR MUTILATE THIS CARD

THE PORT OF NEW YORK AUTHORITY AND SUBURBAN TRANSIT ENGINEERING BOARD 75 WEST STREET, NEW YORK CITY

1 WRITE IN THE BLANK BELOW — I START THIS TRIP FROM — TOWN OR CITY

2 WRITE IN THE BLANK BELOW — MY ULTIMATE DESTINATION FOR THIS TRIP IS — TOWN OR CITY

3 CHECK (✓) ONE SQUARE BELOW — I TO REACH THE RAILROAD STATION
1. WALK OR USE ONE OF THE FOLLOWING
2. BUS
3. SURFACE STREET CAR
4. PRIVATE AUTO
5. TAXI

4 CHECK (✓) ONE SQUARE BELOW — THE KIND OF TICKET I RIDE ON IS, A
1. MONTHLY
2. ONE WAY
3. ROUND TRIP
4. 25-TRIP
5. 50-TRIP
6. EX-TRIP
7. SCHOOL
8. EMP. ½ RATE
9. PASS

5 WRITE IN THE BLANK BELOW — I BOARD THE TRAIN AT — STATION

6 WRITE IN THE BLANK BELOW — I CHANGE TRAINS ON THIS RAILROAD AT — STATION — STATION

7 WRITE IN THE BLANK BELOW — I LEAVE THE RAILROAD AT — STATION

8 CHECK (✓) ONE SQUARE BELOW — AFTER LEAVING THE RAILROAD, TO REACH MY DESTINATION, I USE
01. W. SIDE I. R. T. SUB.
02. E. SIDE I. R. T. SUB.
03. B. M. T. SUBWAY
04. SHUTTLE (GRAND CENTRAL SUBWAY)
05. 42ND ST.
06. 3 AVE. EL.
07. SURFACE ST. CAR
08. BUS
09. TAXI
10. WALK
11. SECOND AVE. ELEVATED
12. THIRD AVE. ELEVATED
13. SIXTH AVE. ELEVATED
14. NINTH AVE. ELEVATED

PASSENGERS DESTINED TO MANHATTAN — INDICATE DESTINATION IN THIS COLUMN — CHECK (✓) ONE SQUARE BELOW (EAST AND WEST DESTINATION)
LEAVE STREET BY 6TH AVE. / BELOW 14TH ST. / 6TH TO 23RD INCL. / 24TH TO 34TH INCL. / 35TH TO 42ND INCL. / 43RD TO 59TH INCL. / 60TH AND ABOVE
1. WEST SIDE
2. BETWEEN RIVERS
3. EAST SIDE
CHECK (✓) ONE SQUARE BELOW (NORTH AND SOUTH DESTINATION)
4. BELOW VESEY-BEEKMAN U.S.
5. BET. VESEY-BEEKMAN AND 14TH STS.
6. BET. 14TH ST. AND 34TH ST.
7. BET. 34TH ST. AND 59TH ST.
8. ABOVE 59TH ST.

PASSENGERS DESTINED TO ELSEWHERE — INDICATE DESTINATION IN THIS COLUMN — CHECK (✓) ONE SQUARE BELOW
BROOKLYN
1. WILLIAMSBURG—N. Y. SECTION
2. ATLANTIC AVE.—BORO HALL SEC.
3. SOUTH BROOKLYN SECTION
QUEENS
4. FLUSHING SECTION
5. JAMAICA SECTION
6. LONG ISLAND CITY SECTION
7. BRONX
8. STATEN ISLAND
9. NEW JERSEY
10. ELSEWHERE — IF ELSEWHERE WRITE BELOW

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45

POWERS—5116 USE ONLY ONE CARD TO DESCRIBE THIS TRIP BETWEEN ORIGIN AND DESTINATION

PLATE III

These cards were distributed by the railroad train crews to the passengers in Westchester County and Long Island as they started their journey toward Manhattan. Over 300,000 cards were distributed and collected.

The information requested on each card included the town or city from which the passenger started the trip, the facility used to reach the railroad station, the kind of ticket used, the station at which the train was boarded, the railroad transfer point, the point of departure from the train, the transit facilities used in New York City, and the destination in New York City or elsewhere. In addition, all of the particulars regarding each train, its departure time, routing, arrival time, number of cars, conductor's terminal count, and class of train were ascertained through the method of collection.

Coding and Sorting the Cards.

After collection, the census cards were coded, edited, punched and tabulated with the air of electrical counting and sorting machines. These operations and the subsequent analysis of the cards involved a great amount of specialized detail.

In several vehicular census undertakings by other agencies which were considered as fair samples, a return of from 3 to 10% of all the traffic moving was obtained. With the thorough preliminary preparations made in this count, the census of October 26, 1927, netted a return from over 45% of the passengers traveling toward Manhattan on the trains on which cards were distributed.

Analysis of the census cards was started late in November, 1927, and the first preliminary report was presented to the members of the Board on February 2, 1928. Detailed reports followed in rapid succession until August, 1929.

October 26th a Typical Traffic Day.

Wednesday, October 26th, was chosen as a typical midweek day in which travel would not be subject to week-end changes in volume, and the position in the month was chosen because it was not adjacent to any holiday.

After the tabulation of the census was completed, the traffic totals for October 26, 1927, as reported by the auditing departments of the railroads, were compared and the choice of that day as an average was confirmed. This comparison follows:

Total Inbound Passengers

	October 26, 1927	Daily Average 1927
Combined Sectors	261,562	262,362
Westchester Sector	91,650	96,681
Long Island Sector	169,912	165,681
New York Central Railroad	47,919	50,475
New York, New Haven & Hartford R. R.	26,977	28,354
New York, Westchester & Boston Ry.	16,754	17,852
Long Island Railroad	169,912	165,681

Daily Inbound Railroad Passengers.

On the day of the census there were in excess of 91,000 railroad passengers traveling in or through the Westchester sector and nearly 170,000 passengers moving in or through the Long Island sector. An analysis of this traffic may be found in Tables I and II.

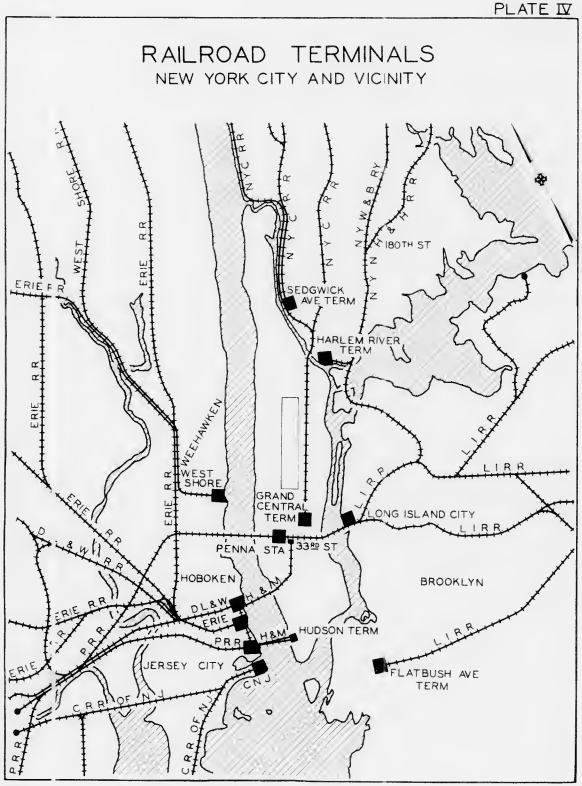
Those Passengers Who Did Not Enter Manhattan.

The analysis of the traffic from the Westchester sector indicated that 9.3% of the suburban passengers originated and terminated without entering New York City. A similar figure for the Long Island was 7.6%.

Points of Origin of Traffic in the Suburban Sectors.

As this was primarily a suburban railroad passenger count in two of the three suburban sectors, it was important to ascertain how well the limits established for the New York Metropolitan District by the Merchants' Association of New York, and adopted by the Suburban Transit Engineering Board as its suburban transit district, actually fitted the suburban transit zones of this area. A map of the two sectors appears opposite page 7. It was found that in Westchester 97.2% and in Long Island 96.8% of the suburban passengers boarded trains to New York City from points within the Metropolitan District.

PLATE IV



All of the passengers, except those on through or long distance trains, were classified as suburban passengers, of whom 32% came from Westchester and 68% from Long Island. Not all of the suburban passengers originated beyond the New York City limits. Analyses showed that of those from Westchester 14% boarded trains at stations within the city limits, while from Long Island the corresponding percentage was 55%. Considering both sectors as a single unit, the entire journey of 39% of the passengers on the suburban trains was within the city limits.

Annular Zone Distribution from New York Terminals.

The greatest concentration of origin traffic as defined by zones, five miles in extent, and concentric about the New York City terminals; i.e., Sedgwick Avenue, Harlem River and 180th Street, and Grand Central, in the Westchester sector, occurred in that zone between 15 and 20 miles from the respective delivery points in New York City. In the Long Island sector, with its Pennsylvania Station, Long Island City and Flatbush Avenue terminals, the corresponding zone was found to be 10 and 15 miles.

Over 40% of the suburban passenger traffic from the Westchester sector originated within a radius of 15 miles from the New York City railroad terminals, and 80% within the 25 mile radius. In the Long Island sector more than 57% originated within a radius of 15 miles and 91% within the 25 mile radius.

Plate V, opposite page 13, and Table IV, show this distribution by zones for each of the two sectors.

Average Length of Suburban Passenger Ride.

The average length of suburban passenger ride in Westchester was 19 miles and in Long Island, 17.5 miles. This resulted from an analysis of all suburban trains regardless whether the passenger's point of origin was within or without the boundaries of New York City. If only those inbound suburban passengers who boarded trains outside of the New York City limits were considered, the average ride for the Westchester passenger was 20.8 miles and for the Long Island passenger, 24.0 miles. For those suburban passengers whose journey was wholly within New York City, the average ride was 8.9 miles for the Westchester traveler and 12.1 miles for the Long Island rider.

Facilities Used by Inbound Passengers to Reach Their Railroad Station.

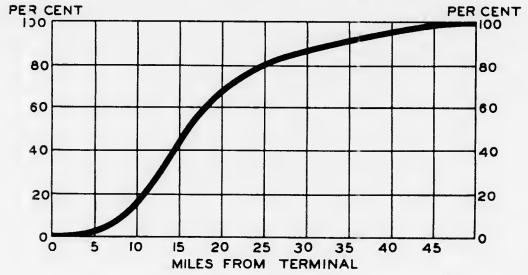
More than three-fourths of the suburban passengers in the two sectors lived within walking distance of their railroad stations, while the private automobile, bus, street car and taxi followed in the order names as means of local transportation from their homes to the railroad station.

A summary of these facilities and their uses may be found in Table V.

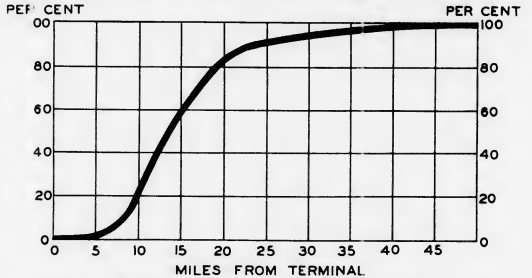
PLATE V

PROPORTION OF TOTAL SUBURBAN TRAFFIC IN RELATION TO DISTANCE OF ORIGIN FROM TERMINAL

WESTCHESTER SECTOR



LONG ISLAND SECTOR



SOURCE: SUBURBAN PASSENGER CENSUS OF OCTOBER 1927

Types of Tickets Used by the Suburban Passengers.

If the through train passengers are omitted from consideration, the percentage of riders traveling at less than the one-way and round trip fares formed 87% and 98% respectively of the total from the Westchester and Long Island sectors. A chart showing the various types of tickets used appears opposite page 15. Detailed data on the types of tickets used may be found in Table VI.

Hourly Passenger Loads on New York Terminals.

The New York terminals of the suburban railroads are required to accommodate a very large percentage of their inbound daily passengers within the limits of one hour of tremendous activity and congestion.

This hour at the Grand Central Terminal on the day of the census occurred from 8:10 to 9:09 A.M., during which time 29,000 passengers arrived. This was 51% of the entire twenty-four hour inbound total for this terminal. The New York Central Railroad alone handled 20,200 passengers, or 54% of its total daily inbound business during its maximum hour between 8:04 and 9:03 A.M.

The three terminals of the Long Island Railroad handled in excess of 46,000 passengers during their respective maximum hours. The greatest number of these were carried into Pennsylvania Station between 7:50 and 8:49 A.M., when 28,300, or 40% of the twenty-four hour inbound Long Island passengers using this terminal arrived.

A table showing these maximum sixty minute periods for the Westchester and Long Island sectors follows:

Terminal	Maximum 60 Minute Period	Passengers	Percent of 24 Hour Total
Grand Central	8:10 - 9:09 A.M.	29,051	51.0%
Harlem River	7:45 - 8:44 A.M.	3,552	26.4
Sedgwick Avenue	7:56 - 8:55 A.M.	806	48.0
Pennsylvania (L.I.R.R. passengers)	7:50 - 8:49 A.M.	28,299	39.7
Flatbush Avenue	7:30 - 8:29 A.M.	16,662	35.8
Long Island City	7:38 - 8:37 A.M.	1,454	64.2

Destinations.

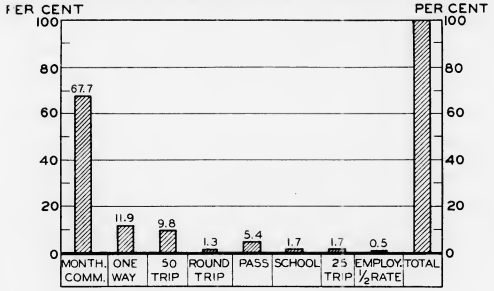
The suburban railroad passengers seek a wide range of destinations after leaving their incoming trains. The principal centers are the trade, manufacturing, shopping, theatrical and financial districts in New York City.

For census purposes, Manhattan was divided throughout its area south of 62d Street into a series of zones as shown opposite page 19. These are the same zones used for traffic studies by the Board of Transportation and the New York State Transit Commission.

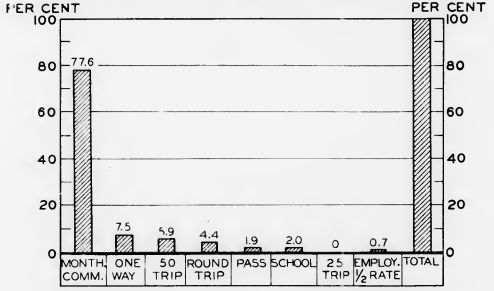
PLATE VI

TYPES OF RAILROAD TICKETS USED BY INBOUND SUBURBAN PASSENGERS

WESTCHESTER SECTOR



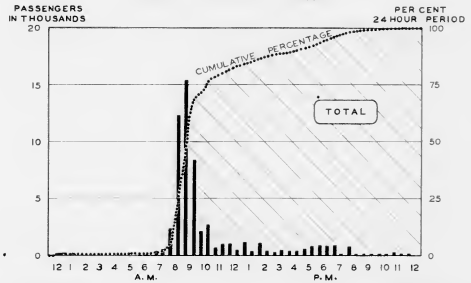
LONG ISLAND SECTOR

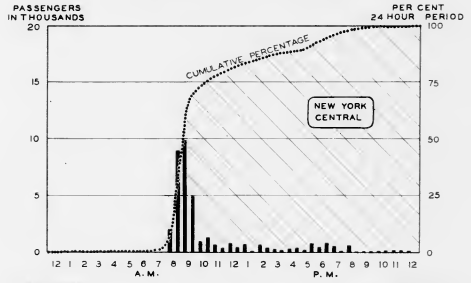


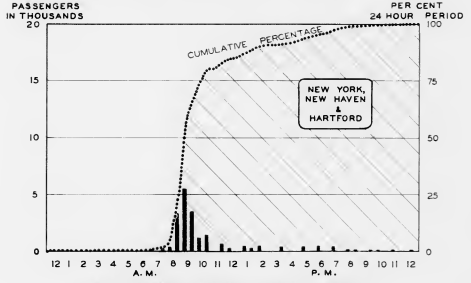
SOURCE: SUBURBAN PASSENGER CENSUS OCTOBER 1927

PLATE VII

DAILY INBOUND PASSENGERS ARRIVING EACH HALF HOUR AT GRAND CENTRAL TERMINAL


PASSENGERS IN THOUSANDS
PER CENT 24 HOUR PERIOD
CUMULATIVE PERCENTAGE
TOTAL
12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12
A.M.
P.M.

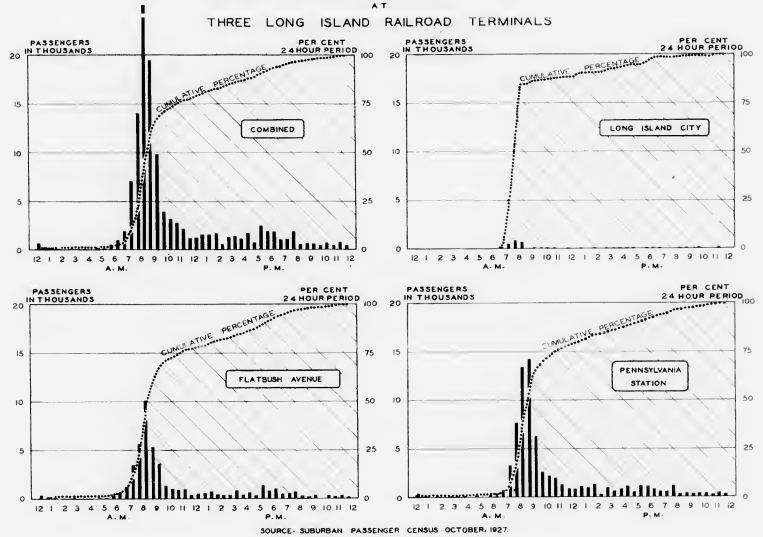

PASSENGERS IN THOUSANDS
PER CENT 24 HOUR PERIOD
CUMULATIVE PERCENTAGE
NEW YORK CENTRAL
12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12
A.M.
P.M.


PASSENGERS IN THOUSANDS
PER CENT 24 HOUR PERIOD
CUMULATIVE PERCENTAGE
NEW YORK, NEW HAVEN & HARTFORD
12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12
A.M.
P.M.

SOURCE: SUBURBAN PASSENGER CENSUS OCTOBER, 1927.

PLATE VIII

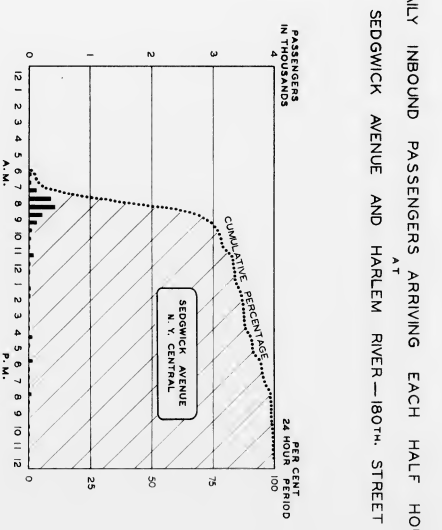
DAILY INBOUND PASSENGERS ARRIVING EACH HALF HOUR
AT
THREE LONG ISLAND RAILROAD TERMINALS



SOURCE- SUBURBAN PASSENGER CENSUS OCTOBER, 1927.

PLATE IX

DAILY INBOUND PASSENGERS ARRIVING EACH HALF HOUR
AT
SEDGWICK AVENUE AND HARLEM RIVER — 180TH. STREET

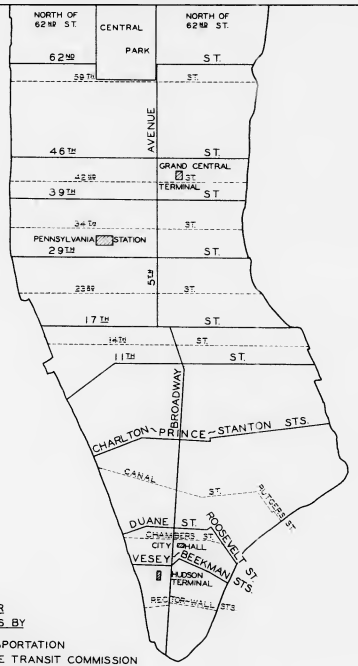


SOURCE: SUBURBAN PASSENGER CENSUS OCTOBER, 1927.

PLATE X

MANHATTAN DESTINATION ZONES

SUBURBAN PASSENGER CENSUS 1927



ZONES USED FOR TRAFFIC STUDIES BY

BOARD OF TRANSPORTATION
NEW YORK STATE TRANSIT COMMISSION
SUBURBAN TRANSIT ENGINEERING BOARD

Slightly more than 30% of the suburban passengers from the Westchester sector, whose destinations were on Manhattan, confined themselves to the Grand Central zone between 46th and 39th Streets. If the adjacent zones between 46th and 62d Streets and 39th and 29th Streets were combined with the Grand Central zone, slightly less than 53% remained in the district between 62d Street and 29th Street. About 19% went to destinations on the southern tip of Manhattan below Vesey Street. The remaining 28% had destinations in the other zones.

Since this census was taken there have been a number of large office buildings completed in the 42d Street district. Undoubtedly this has materially increased the proportion of the passengers from Westchester seeking destination in this vicinity.

The traffic of the Long Island Railroad over the two routes from Jamaica divided itself into the proportion of 29% to Flatbush Avenue and 71% to Pennsylvania Station.

In so far as ultimate destinations on Manhattan were concerned, more than 25% of the suburban passengers from the Long Island sector remained in the zone below Vesey Street. The Pennsylvania Station zone between 39th and 29th Streets was the destination for only 15%, while another 15% went to the zone between 46th and 39th Streets. The remaining 45% sought other destinations.

A comparison of destination zones for these sectors follows:

Delivery Zones	Westchester Sector	Long Island Sector
North of 62d St.	6.10%	7.15%
62d St. - 46th St.	11.96	8.15
46th St. - 39th St.	30.72	15.39
39th St. - 29th St.	9.95	15.69
29th St. - 17th St.	8.49	8.40
17th St. - 11th St.	3.60	4.59
11th St. - Charlton, Prince Sts.	3.02	3.79
Charlton, Prince Sts.-Duane, Roosevelt Sts.	3.29	5.13
Duane, Roosevelt Sts.-Vesey, Beekman Sts.	3.73	5.98
Below Vesey, Beekman Sts.	19.14	25.73
	100.00%	100.00%

Destination of Passengers from the Principal Terminals.

There are three principal terminals; Grand Central Terminal, Pennsylvania Station, and Flatbush Avenue, which are used by the major portion of the suburban passengers. More than one-third of the passengers into Grand Central Terminal whose destinations were on Manhattan remained in the Grand Central zone between 46th and 39th Streets, which is but a short distance from the terminal. Almost 20% traveled an extra 3.5 miles using city transportation facilities to reach destinations on the southern tip of Manhattan below Vesey Street.

From the Pennsylvania Station 20% remained in the Pennsylvania Station zone between 33th and 20th Streets, and 13% completed their journey by the city transportation facilities to the zone below Vesey Street.

More than 37% of the passengers into Flatbush Avenue remained in Brooklyn (this represented only 15% of all the Long Island Railroad passengers); 34% used the city subways to the Manhattan zone below Vesey Street, and 2% continued to the Pennsylvania Station zone. The remaining 27% sought other destinations.

Local Transit Facilities Used by Railroad Passengers in Manhattan.

After leaving the terminals many of the suburban passengers are dependent upon local transit facilities in order to reach their ultimate destinations.

From Grand Central Terminal over 24,000, or 42% of the total, walked to their destinations; 6,300, or 11% rode surface conveyances; 900, or 1.5% traveled above the streets on the elevated railroads, and 25,800, or 45.5% traveled under the streets in subways. In other words, 42% walked and the remaining 58% became passengers on some wheeled vehicle, above, through or under the streets of Manhattan.

Of the Long Island Railroad passengers using the Pennsylvania Station, 21,500, or 30.2% walked to their destinations; 4,700, or 6.6% used surface conveyances; 1,100, or 1.5% traveled via elevated railroads, and 44,000, or 61.7% traveled on the subways. This means that 30.2% of the Long Island Railroad passengers from this station walked and 69.8% used some wheeled vehicle to reach their destinations after leaving the terminal.

The accompanying table shows the percentages of the total passengers from each terminal using the local transit facilities in New York City to reach their destinations after leaving the terminals.

	Subways	Elevated	Street Vehicles	Walk	Total
Westchester Sector Passengers from					
Grand Central Terminal	45.25%	1.55%	11.00%	42.20%	100.00%
Harlem River & 180th Street	29.67	39.50	13.50	17.33	100.00
Selgwick Avenue Terminal	5.37	85.82	4.34	4.47	100.00
Long Island Sector Passengers from					
Pennsylvania Station	61.65	1.59	6.58	30.18	100.00
Flatbush Avenue Terminal	82.10	0.18	6.96	10.76	100.00
Long Island City Terminal	12.67	0.32	24.24	62.77	100.00

SOME COMPARISONS OF SUBURBAN RAILROAD TRAFFIC

IN THE NEW JERSEY, WESTCHESTER AND LONG ISLAND SECTORS

Suburban Railroad Passengers Not Entering New York City.

When all of the suburban railroads in the Metropolitan District were considered, it was indicated by census that somewhat under 10% of the total passengers carried did not enter New York City but were strictly local riders between other communities in the district.

In New Jersey, the suburban railroad census of September 24, 1924, disclosed that 9.7% of the inbound railroad passengers were local riders between points outside of New York City; while the census of October 26, 1927, indicated that about 9.3% of the Westchester riders, and 7.6% of the Long Island riders were local passengers.

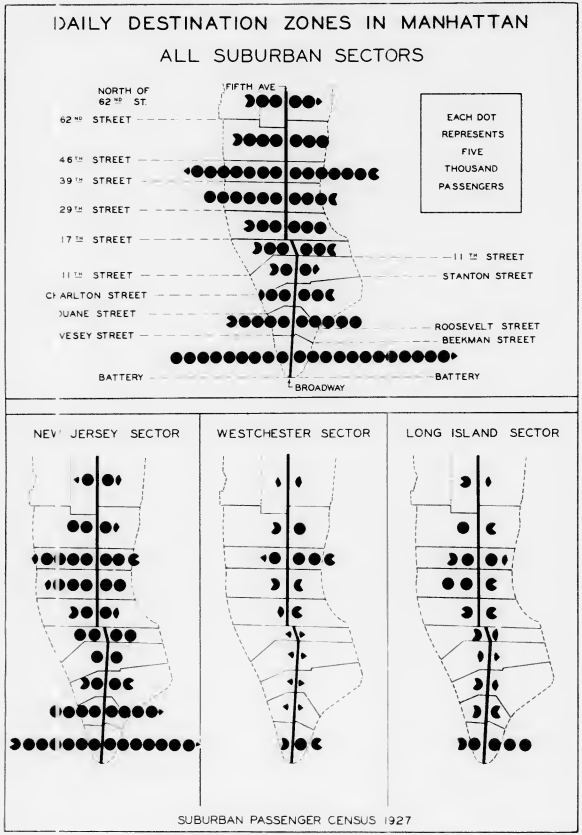
Maximum Sixty Minute Passenger Density at Terminals.

The maximum passenger density for a sixty minute interval varied at the different terminals in the Metropolitan District. This period ranged between 7:30 and 8:29 A.M. at the Flatbush Avenue Terminal of the Long Island Railroad, to 9:10 to 9:09 A.M. at Grand Central Terminal.

The largest number of passengers carried into a single terminal during the hour of maximum density was 29,000 at Grand Central Terminal. The Long Island Railroad passengers into Pennsylvania Station during the rush hour numbered 28,300. The Hudson Terminal of the Hudson & Manhattan Railroad accommodated 28,100, and the Jersey City terminal of the Erie Railroad received 26,700 during their respective maximum hours.

The largest number of passengers handled during the rush hour by any single railroad was the 46,400 on the Long Island Railroad into its three terminals. The nearest approach to this was 43,500 passengers, which the Hudson & Manhattan Railroad brought across the Hudson River from New Jersey.

PLATE XI



One of the most important facts brought out by the 1924 and 1927 censuses was the large proportion of the total inbound passenger movement handled during a single hour in the morning. At ten of the terminals in the metropolitan district, which handled by far the larger number of suburban passengers, this proportion ranged from one-quarter to over half of the entire twenty-four hour inbound business. These terminals are -

Terminal	Rush Hour Passengers	Percentage of 24 Hour Total
Central Railroad of New Jersey	11,072	42.6%
Delaware, Lackawanna & Western	18,168	55.4
Erie	26,696	53.9
Hudson Terminal	28,068	26.3
Pennsylvania Station (from N. J.)	5,879	31.7
Weehawken	6,343	43.5
Grand Central Terminal	29,051	51.0
Pennsylvania Station (from L. I.)	28,299	39.7
Flatbush Avenue	16,662	35.8
Harlem River	3,552*	26.4

*Includes 952 passengers transferring at 180th Street.

Destinations.

A glance at Plate XI indicates that when the daily suburban railroad passengers from all three sectors are considered, about 106,000 were destined to the half mile area below Vesey Street; 48,500 had destinations in the square mile zone between 29th and 39th Streets; and 70,200 were confined to the three-quarter square mile area between 39th and 46th Streets.

Local Transit Facilities Used in New York City.

Nearly 229,000 suburban railroad passengers entering New York City walked from terminals to destinations. Another 203,000 used the city subways; 30,000 rode on the elevated, and over 50,000 used surface conveyances. The totals for the three sectors are shown in the accompanying table.

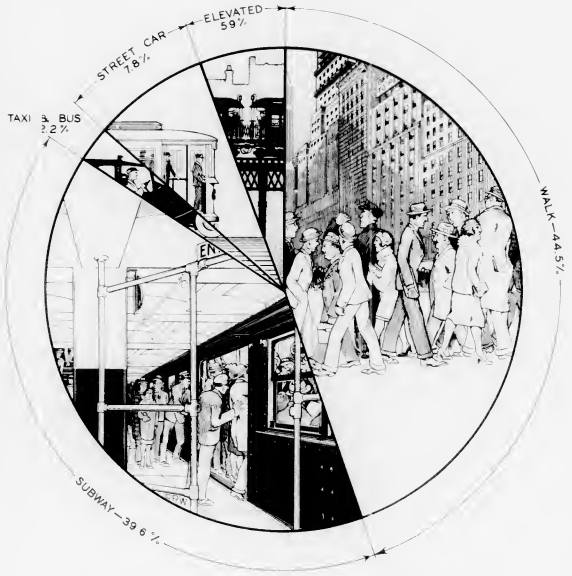
Facility	Passengers (1927)	Percent
Subway	202,961	39.6%
Elevated	30,005	5.9
Street Car	40,045	7.8
Bus and Taxi	11,183	2.2
Walk	228,301	44.5
Total	512,495	100.0%

SUBURBAN TRANSIT ENGINEERING BOARD

PLATE XII

FACILITIES USED BY SUBURBAN PASSENGERS AFTER LEAVING TERMINALS TO REACH THEIR DESTINATIONS IN NEW YORK CITY

EXPRESSED IN PERCENTAGES

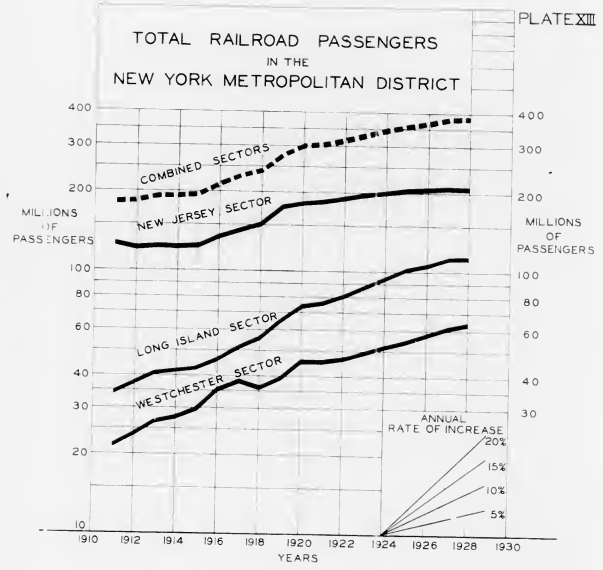


FACILITY	NEW JERSEY SECTOR	WESTCHESTER SECTOR	LONG ISLAND SECTOR	COMBINED
ELEVATED	6.6%	10.6%	1.0%	5.9%
STREET CAR	8.6	8.6	5.2	7.8
TAXI AND BUS	2.2	2.7	1.8	2.2
SUBWAY	28.3	41.4	68.7	39.6
WALK	54.3	36.7	23.3	44.5
TOTAL	100.0%	100.0%	100.0%	100.0%

GROWTH OF TOTAL ANNUAL PASSENGER TRAFFIC

in the

NEW YORK METROPOLITAN DISTRICT



GROWTH OT TOTAL ANNUAL PASSENGER TRAFFIC

On the day of the census the through or long distance trains entering Grand Central Station carried 15% of the total traffic distributed into and through Manhattan. Suburban trains carried the remaining 85% of the traffic. All of these passengers passed through or originated in the Westchester sector.

The Pennsylvania Station, on the other hand, received its passengers from the New Jersey and Long Island sectors. In 1927 over 80% of the total traffic into this station was from Long Island and of this, only a small proportion was through or long distance traffic.

Between 1914 and 1927 the total traffic in and out of Grand Central Terminal increased over 100%, from 22½ million to 48 million. The New York Central Railroad traffic alone increased from 12½ million to 28 million annual passengers, or an average annual increase of over 1,200,000 passengers. In the same period the New York, New Haven & Hartford Railroad increased its Grand Central traffic from a little over 10 million to over 17 million annual passengers, or an average annual increase of over 500,000 passengers.

Similarly, the Long Island traffic in and out of Pennsylvania Station has increased from 11 million passengers in 1914 to 47½ million in 1927, or an increase of over 300% in thirteen years.

In 1914 the traffic on the New Jersey railroads to and from New York City amounted to about 123 million passengers, and in 1927 the number had increased to 208½ million, or an increase of about 70% in thirteen years. A table showing the growth of traffic in each sector will be found in Appendix B.

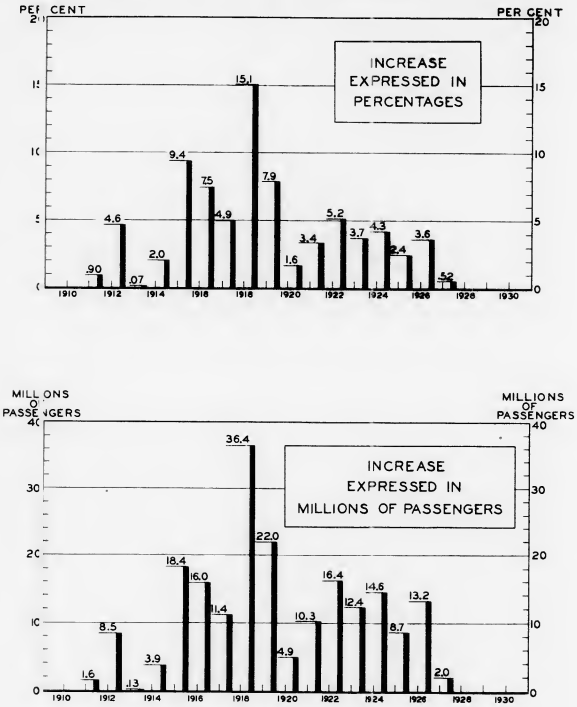
Even since the date of the last report (January 11, 1928) the railroads from Westchester and Long Island are handling nearly 21,000 passengers more daily than they did on a corresponding day two years ago. The growth from the New Jersey sector has not been so great. This comparison is shown in the following table.

DAILY VOLUME OF PASSENGERS MOVING TOWARD NEW YORK CITY

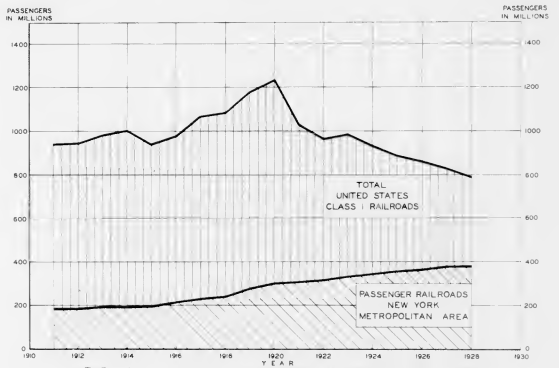
Sector	1926	1928	Increase (1926-1928)
New Jersey	316,100	318,100	2,000
Westchester	86,300	95,400	9,100
Long Island	155,500	167,000	11,500
Total	557,900	580,500	22,600

PLATE XIV

GROWTH OF TOTAL RAILROAD TRAFFIC
IN THE
NEW YORK METROPOLITAN DISTRICT
INCREASE OF EACH YEAR OVER PRECEDING YEAR



The total passengers on Class I Railroads (those handling an annual business in excess of $1,000,000) for the entire United States have been falling off at a substantial rate. On the contrary, the total passengers in the New York Metropolitan District, now representing 48.4% of the total on Class I Railroads in the United States, have been steadily increasing. This is best shown by the following chart. Detailed figures appear in a table in Appendix B.



COMPARATIVE CHANGES IN VOLUME OF PASSENGER TRAFFIC
TOTAL CLASS I RAILROADS OF THE UNITED STATES AND PASSENGER RAILROADS NEW YORK METROPOLITAN AREA

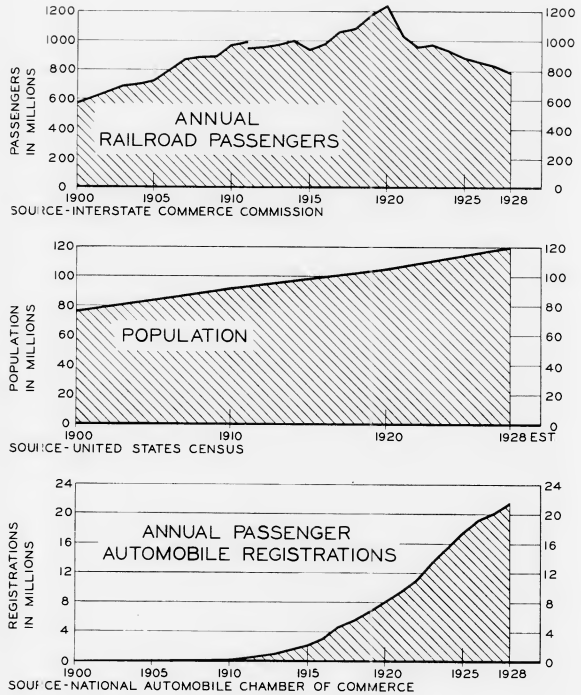
PLATE XV

A comparison of this decline in the number of railroad passengers carried in the United States and the number of automobile registrations is shown on page 30.

With 82% of the terminal traffic suburban in character and with traffic through Grand Central Terminal increasing 100% in thirteen years, and Pennsylvania Station traffic from Long Island increasing 300% in thirteen years, the limits of the functioning of the present Manhattan distribution for suburban railroad passengers are obvious to the every day suburban railroad traveler to Manhattan.

RAILROAD PASSENGERS
POPULATION
PASSENGER AUTOMOBILE REGISTRATIONS
GROWTH IN THE UNITED STATES

PLATE XVI



SURVEY

OF

SUBURBAN PASSENGER ROLLING EQUIPMENT

SUBURBAN TRANSIT ENGINEERING BOARD
PLATE XVII
SOME TYPES OF PASSENGER CARS
IN THE
NEW YORK METROPOLITAN DISTRICT
SUBWAYS
SUBURBAN RAILROADS
SEATING CAPACITY 44
LENGTH 51.00 FEET WIDTH 8.66 FEET
HEIGHT 12.00 " WEIGHT 74000 LB.
SEATING CAPACITY 120 2-2 SEATING
LENGTH 70.66 FEET WIDTH 10.05 FEET
HEIGHT 14.35 " WEIGHT 176000 LB.
SEATING CAPACITY 60
LENGTH 50.66 FEET WIDTH 8.66 FEET
HEIGHT 12.6 " WEIGHT 65000 LB.
SEATING CAPACITY 78
LENGTH 48.66 FEET WIDTH 9.8 FEET
HEIGHT 13.9 " WEIGHT 117200 LB
SEATING CAPACITY 78
LENGTH 63.33 FEET WIDTH 10.8 FEET
HEIGHT 13.5 " WEIGHT 84.000 LB
SEATING CAPACITY 78
LENGTH 72.7 FEET WIDTH 10.09 FEET
HEIGHT 14.24 " WEIGHT 93.00 LB

SURVEY OF SUBURBAN PASSENGER ROLLING EQUIPMENT.

A large part of a suburban transit system in the New York Metropolitan District would consist of subway construction. The main arteries on Manhattan would function as distributing lines for passengers coming over the several railroads that now serve the suburban sector. The size of transportation units and type of equipment employed in handling this traffic will materially affect the construction cost. One of the paramount questions to be determined will be whether the existing types of equipment used on the suburban railroads can be introduced directly into this suburban subway system or whether the alternative of using special equipment, built for the purpose, shall be considered.

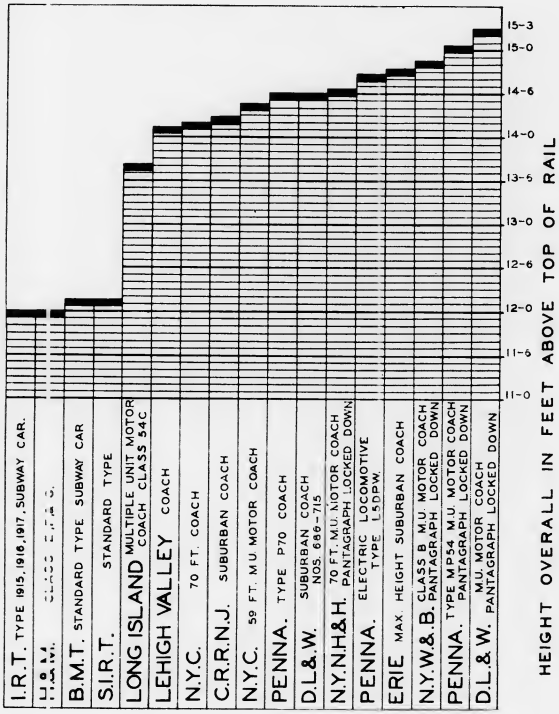
Preliminary consideration of this question necessitated a survey of the passenger equipment on the rapid transit systems and of the suburban railroads in the district. The types of subway rapid transit equipment, designed for operation over lines having sharp curves and steep grades not encountered in ordinary railroad practice, are considerably smaller in cross section than the average suburban coach. This can best be seen by reference to Plate XVII on which a few of the existing types of the two classes of equipment are shown.

Wide Range in Sizes of Suburban Equipment.

It is apparent from a study of the few types illustrated that the suburban cars as a class offer a wide variation in size and general characteristics. This is to be expected when it is considered that each railroad has developed a type of car to meet its own particular transportation problem. It might be said that this deviation from a standard type has been governed to a great extent by the limitations of the terminal of each railroad at the New York City end of the line, both as to the motive power used and general dimensions of the car.

SUBURBAN TRANSIT ENGINEERING BOARD PLATE XVIII

OVERALL HEIGHT OF EQUIPMENT
OF PASSENGER RAILROADS
NEW YORK METROPOLITAN DISTRICT


I.R.T. TYPE 1915, 1916, 1917, SUBWAY CAR.
H.& M. CLASS [illegible]
B.M.T. STANDARD TYPE SUBWAY CAR
S.I.R.T. STANDARD TYPE
LONG ISLAND MULTIPLE UNIT MOTOR COACH CLASS 54C
LEHIGH VALLEY COACH
N.Y.C. 70 FT. COACH
C.R.R.N.J. SUBURBAN COACH
N.Y.C. 59 FT. M.U. MOTOR COACH
PENNA. TYPE P70 COACH
D.L.&W. SUBURBAN COACH NOS. 686-715
N.Y.N.H.&H. 70 FT. M.U. MOTOR COACH PANTAGRAPH LOCKED DOWN
PENNA. ELECTRIC LOCOMOTIVE TYPE L5DPW.
ERIE MAX. HEIGHT SUBURBAN COACH
N.Y.W.&B. CLASS B M.U. MOTOR COACH PANTAGRAPH LOCKED DOWN
PENNA. TYPE MP54 M.U. MOTOR COACH PANTAGRAPH LOCKED DOWN
D.L.&W. M.U. MOTOR COACH PANTAGRAPH LOCKED DOWN
15-3
15-0
14-6
14-0
13-6
13-0
12-6
12-0
11-6
11-0
HEIGHT OVERALL IN FEET ABOVE TOP OF RAIL

The following tabulation of the size and capacity of some of the cars of the suburban railroads will further illustrate this variation.

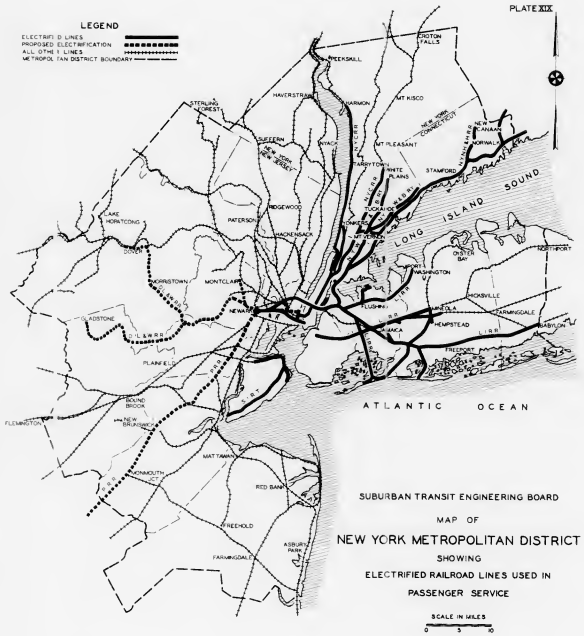
Railroad	Seating Capacity	Length Overall	Width Overall	Height Overall	Type of Motive Power
C.R.R. of N.J.	78	72' 2"	9' 10½"	14' 2 7/8"	Steam Locomotive
D.L. & W.R.R.	84	71' 0"	9' 11"	15' 3"	Electric-Multiple Unit
Erie R.R.	86	72' 7½"	10' 1⅜"	14' 9 9/16"	Steam Locomotive
Lehigh Valley R.R.	72	68' 1⅝"	10' 0⅝"	14' 1 3/8"	Steam Locomotive
Long Island R.R.	78	64' 5¾"	9' 10½"	13' 8¼"	Electric-Multiple Unit
N.Y.C.R.R.	100	69' 5"	9' 11"	14' 4 5/8"	Electric-Multiple Unit
N.Y.C.R.R.	96	73' 11⅜"	10' 0 1/8"	14' 2"	Steam Locomotive
N.Y.N.H.&H.R.R.	120	80' 1½"	10' 0 9/16"	14' 4¼"	Electric-Multiple Unit
N.Y.W.&B.Ry. Class B	80	72' 7⅛"	9' 9½"	14' 10½"	Electric-Multiple Unit
P.R.R. (MP54)	72	64' 5⅜"	9' 11⅛"	15' 0 7/8"	Electric-Multiple Unit
P.R.R. (P70)	88	80' 3⅜"	9' 11⅛"	14' 6"	Steam Locomotive
S.I.R.T.Ry.	71	67' 4"	9' 10½"	12' 1 11/16"	Electric-Multiple Unit

A diagram has been prepared to show graphically the various heights of the equipment of the different lines, including the rapid transit lines, and a few passenger electric locomotives. This is shown on Plate XVIII.

Motive Power of the Suburban Railroads.

The location on Manhattan of the terminals of several of the larger roads; viz., the New York Central, the New York, New Haven & Hartford, the Pennsylvania, and the Long Island Railroads, has necessitated their electrification. As the Manhattan terminals used by these railroads must be reached by means of tunnels, a third rail at present is the common method of supplying electric power. One other railroad of the Metropolitan District, the Staten Island Rapid Transit Railway, not having a Manhattan terminal but operating in the Borough of Richmond, uses this means of power supply. Other electrified railroads in the district employ a pantagraph for power collection from an overhead conductor. The New York, New Haven & Hartford Railroad, the New York, Westchester & Boston Railway, and the portion of the Delaware, Lackawanna & Western Railroad now being electrified, use this method. As the trains of the New York, New Haven & Hartford Railroad must use portions of roadbed jointly with the New York Central in order to reach the Grand Central Terminal, because the latter railroad is operated by third rail, it is necessary that the electric locomotives and motor cars of the New York, New Haven & Hartford Railroad be equipped to operate from the two different sources of power.

The Pennsylvania Railroad proposes the use of an overhead conductor in the electrification of its lines from Washington and Philadelphia to New York. The extent of electrification, either in actual use or under construction, for the entire New York Metropolitan District is shown on page 36.



The kind of power used and the method of collection on the various electrified railroads of the district is summarized as follows:

ELECTRIFIED PASSENGER RAILROADS OF THE NEW YORK METROPOLITAN DISTRICT

Railroad	Voltage	Method of Collection	Position of Contact Shoe
Rapid Transit			
B. M. T.	600 D.C.	Third Rail Shoe	Top of Third Rail
I. R. T.	600 D.C.	" " "	" " " "
S. I. R. T.	600 D.C.	" " "	" " " "
Suburban Transit			
H. & M.	600 D.C.	" " "	" " " "
N. Y. W. & B.	11,000 A.C.	Pantagraph	- - - - -
Suburban Railroads			
D. L. & W. R. R.	3,000 D.C.	"	- - - - -
L. I. R. R.	600 D.C.	Third Rail Shoe	Top of Third Rail
N. Y. C. R. R.	600 D.C.	" " "	Bottom of Third Rail
N. Y. N. H. & H.	11,000 A.C.	Pantagraph	- - - - -
	600 D.C.	Third Rail Shoe	Bottom of Third Rail
P. R. R.	600 D.C. (in operation)	" " "	Top of Third Rail
	11,000 A.C. (proposed)	Pantagraph	- - - - -

These different current characteristics and types of electrical equipment constitute one of the major difficulties involved in considering any suburban transit system which would attempt to unite the suburban operation of many of the railroads into a single system.

Determination of a Tentative Tunnel Diameter.

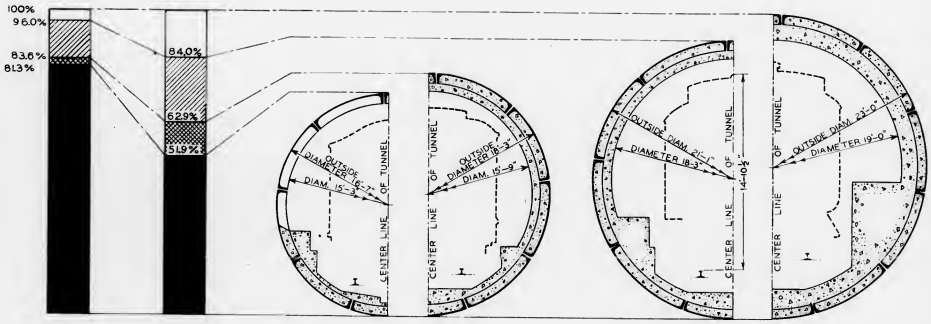
From the data collected regarding the various sizes of equipment in use in the district, a maximum equipment diagram was selected which would include the types of cars adaptable for use in a subway system. A typical tunnel diameter of 21' 1" was selected by using this maximum equipment diagram. For the sake of comparison with existing tunnels this is shown on Plate XX as the Suburban Transit Engineering Board type.

The size of the tunnel considered, accommodating equipment to a height of 14' 10½" above the top of rails, would preclude the use of certain of the largest equipment of the various railroads. An additional study is now in progress to determine the size and cost of a tunnel to accommodate the equipment which would be necessary with a system requiring pantagraphs to collect its motive power.

SUBURBAN TRANSIT ENGINEERING BOARD

PLATE XX

COMPARISON OF SUBAQUEOUS TUBE SIZES



COST
INCLUDING STATIONS COMPARED WITH P.R.R. SIZE TUNNEL

AREA
OF CROSS SECTION COMPARED WITH P.R.R. SIZE TUNNEL

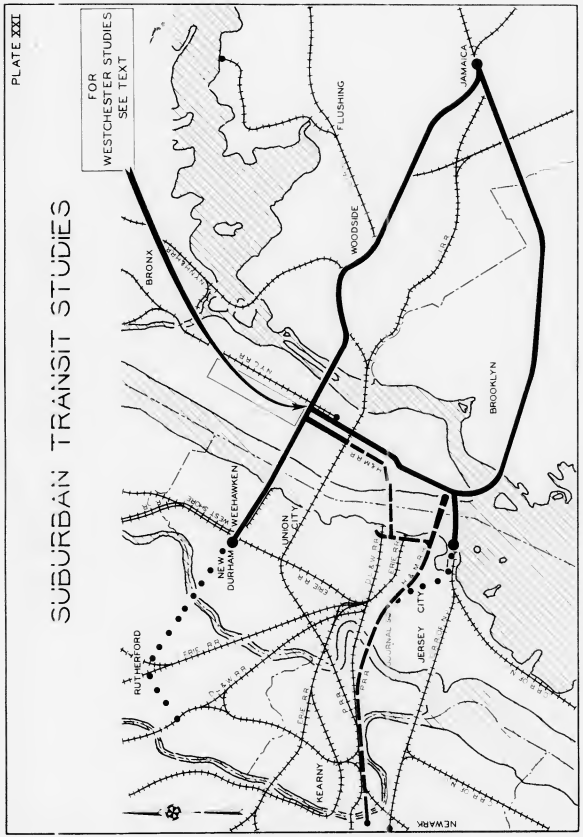
HUDSON & MANHATTAN
HUDSON RIVER TUBES
H & M. CAR SHOWN

N.Y.C. BOARD OF TRANSPORTATION
EAST RIVER TUBES
B.M.T. CAR SHOWN

SUBURBAN TRANSIT ENGINEERING BOARD
INVESTIGATED SIZE

PENNSYLVANIA RAILROAD
HUDSON RIVER TUBES
P.R.R. CAR P70 SHOWN

PROGRESS IN THE DEVELOPMENT
of the
COMPREHENSIVE CO-ORDINATED SUBURBAN TRANSIT PLAN



NEW JERSEY SECTOR

The beginning of official public recognition of the suburban transit situation in Metropolitan New Jersey dates from 1922, when the New Jersey Legislature authorized the creation of the North Jersey Transit Commission. Since that time steady and consistent progress has been made by that body in engineering and economic studies for practical relief.

These studies started from the analysis of the traffic census taken in the New Jersey sector on September 24, 1924, which showed that more than 90% of the passengers using railroad trains had ultimate destinations across the river in New York City. The problem then became one of additional Hudson River crossings and distribution on Manhattan.

This distribution problem is the same as that confronting the passengers from the other two sectors of the Metropolitan District. Inevitably the exchange of information with other sectors of the larger Metropolitan District led to broader regional consideration.

When the Suburban Transit Engineering Board began to function through its New Jersey Committee, it re-examined the principles underlying the various New Jersey schemes in relation to plans in Long Island and Westchester. It was recognized that the North Jersey Transit Commission had also the problem of intra state transit which should be coordinated with any plans for additional interstate Hudson River crossings.

Twenty-five studies, including estimates of cost and traffic, were made by the New Jersey Committee. These studies, developed at the conferences, were based upon the general principle adopted by the Board that any proposed suburban transit system should provide distribution for suburban passengers on Manhattan separate from and in addition to the city transportation system. No particular plan has been adopted and an adequate solution of the problem of how to handle and what to do with the suburban rider from New Jersey is still being studied.

There are nine trunk line railroads using terminals in the New Jersey sector. The Hudson & Manhattan, which is not included in that number, serves three terminals of these railroads and provides rapid transit service under the Hudson River into New York City.

The New Jersey Committee in December, 1928, made studies on the basis of the utilization of the Hudson & Manhattan Railroad as a nucleus for a suburban transit system. New Jersey studies then followed with this arrangement as the basis.

Following the meeting of the New Jersey Committee on January 16, 1929, studies along a slightly different line were undertaken. These suggested a suburban transit network for New Jersey territory which would relieve the trunk line railroads of the short distance commuter business. It was the opinion of the Committee that such a network is the final solution toward which the Board should work, but for the present it is believed no such comprehensive scheme can be economically justified. With this in view, on January 30, 1929, the Committee undertook a study to determine the minimum construction which would accomplish traffic relief. The resulting report suggested a north and south suburban transit distributing line in Manhattan, a connection in 57th Street, Manhattan, extending to New Durham, N. J., another extending from the lower end of this distributing line to Communipaw, N. J., and an extension of the Hudson & Manhattan system from 33d Street to 57th Street. The Committee on April 11, 1929, adopted this study as the basis for further consideration. Since that time, extensions to this minimum study plan have been investigated. Two of these extensions are indicated on Plate XXI, opposite page 41.

WESTCHESTER SECTOR

The principal point of interest to the Westchester Sector Planning Committee, after study of the data obtained from the suburban traffic census of October 26, 1927, was the ultimate Manhattan destination of passengers from the three railroads traversing the Westchester sector, and the facilities used to reach that destination.

From the census it was noted that 75.6% of the Westchester commuters entered the Grand Central Terminal over the New York Central and New York, New Haven & Hartford Railroads, 22.2% used the New York, Westchester & Boston Railway, to its various Bronx terminals, and about 2.2% used the Sedgwick Avenue Terminal of the New York Central Putnam Division.

Of the passengers entering the Grand Central Terminal, 56% were destined to points north of 29th Street and less than 20% entered the financial district below Vesey Street. When the Grand Central Terminal alone was considered, the census revealed that 42% of the passengers using this terminal walked to their destination, and the remaining 58% used some transit facility, either on street level, under the street or above the street. Undoubtedly, building activities in the vicinity of this Terminal since the census have changed these percentages, the tendency being to increase the percentage of passengers to and from the Grand Central zone and to decrease the percentage of passengers to and from lower Manhattan.

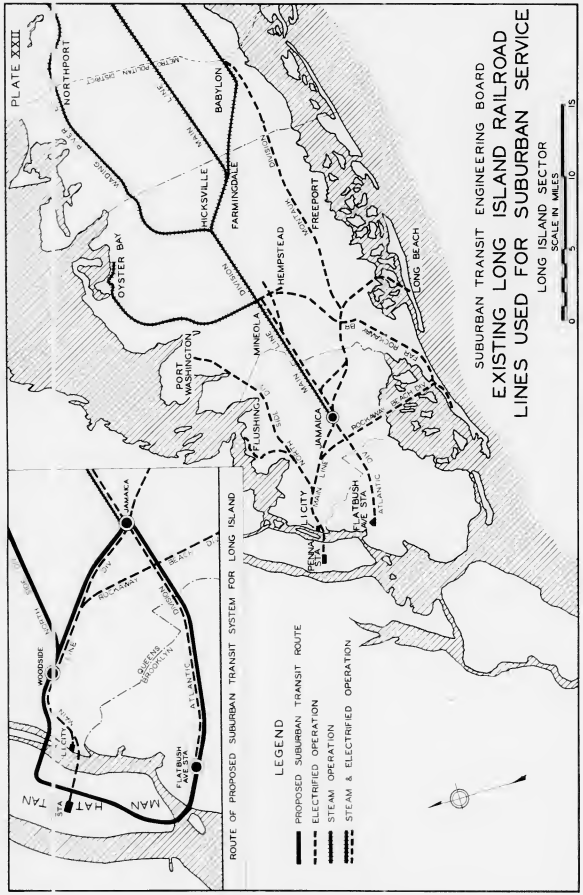
The capacity of the main line from Grand Central Terminal to Mott Haven is now being increased by signalling all four tracks in both directions so that three of the four tracks can be used to carry the peak load in either direction. These improvements with others will add measurably to the present capacity for handling trains during the rush hours. The New Haven operates many short trains to which cars and seats can be added to handle more passengers with present facilities; this is being done as occasion demands.

With minor changes, there is surplus capacity in the Grand Central Station to handle this additional traffic, and it is thought that upon these measures will rest the ability of the railroads to keep abreast of traffic demands until such time as additional facilities may be required.

The major portion of the daily passengers of the Putnam Division of the New York Central Railroad make use of the Grand Central Terminal by transferring at High Bridge to the Hudson Division. The traffic of this division amounts to only 5% of the total traffic of the entire sector.

The New York, Westchester & Boston Railway handles approximately 22% of the commuter traffic of the sector for a 24 hour period. One of the most outstanding facts developed by the census is the relatively even distribution of Westchester & Boston traffic throughout the 24 hours so that during the rush hour period, this railroad handled only 11% of the total passengers carried by all the railroads of the Westchester sector during that rush hour.

The Westchester Sector Planning Committee has given careful consideration to numerous plans and the mass of data incidental to suburban traffic for Westchester County. It has studied nine plans, with the result that two of them have been selected for further investigation, as to their cost, economic and operating practicability.



The Main Line Division of the Long Island Railroad terminates in Manhattan at the Pennsylvania Station, and the Atlantic Division terminates at Flatbush Avenue, Brooklyn. These two lines carry the bulk of the suburban traffic of the Long Island Sector westward from Jamaica. The relative location of these two lines to the densely developed area of lower Manhattan and Brooklyn adapts them as being two of the constituent parts of a suburban transit system. The present routing of trains into the Pennsylvania and Flatbush Avenue Stations involves stub end terminal operation resulting in delay to trains and passengers. This condition would be relieved if these terminals were stations on a through line.

SUGGESTED SOLUTION.

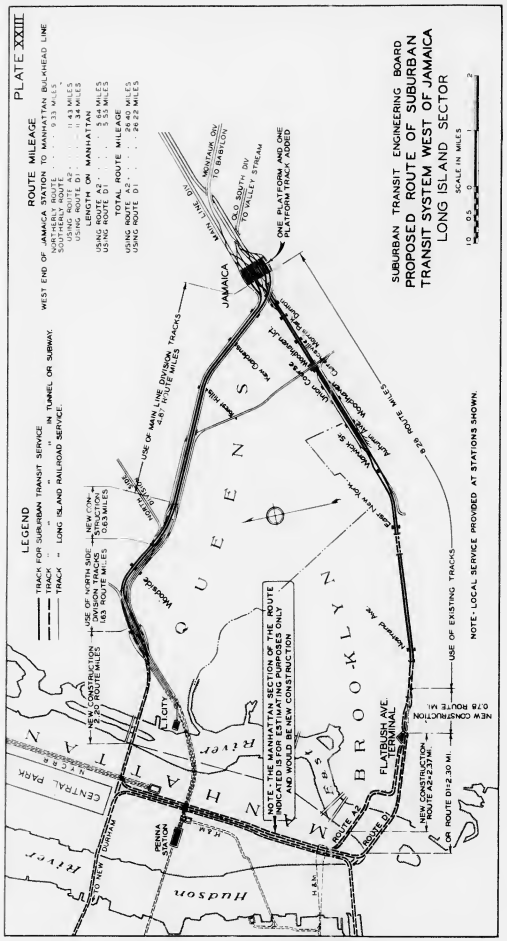
A connecting link between these two main feeder lines, serving as a distributing line in lieu of a terminal for this suburban traffic, would do much to relieve the condition confronting the commuters. The ultimate value of such a scheme was seen in the early studies of this problem to be dependent on the location of this connecting line so as to avoid sections of the existing trackage that are already loaded to capacity and also to distribute passengers on Manhattan below Central Park.

The physical plan tentatively adopted to fulfill these requirements would be essentially a loop operation of the suburban traffic west of Jamaica with the connecting link through Queens, Manhattan and Brooklyn to form the complete loop, as shown on Plate XXII. Such a loop would have two tracks with trains operating around the loop in both directions. This, in effect, would give the capacity of a four track straight away railroad enabling simultaneous operation over both the northerly and southerly legs of the loop from Jamaica. The Manhattan section of this loop would, of course, be a part of a multiple track distributing line shared in common by the traffic from the other suburban sectors. This is shown on Plate XXI. The Pennsylvania Station would continue to function as a terminal of the Long Island Railroad for those passengers from the more distant point of the island. The primary source of traffic for the loop is considered to originate east of Jamaica in the suburban communities which do not have the transportation facilities of the city rapid transit lines. The extensive program undertaken by the city in enlarging the rapid transit facilities within the city boundaries of this sector no doubt will relieve the Long Island Railroad of a large part of the local traffic that now complicates the handling of the through suburban traffic. This will release some of the capacity now taken by this local service for the suburban transit traffic.

USE OF EXISTING TRACK

Wherever possible, use of existing track of the Long Island Railroad west of Jamaica has been suggested as a part of this suburban transit system. Of a total of 26.2 route miles, representing the length of this loop, 14.8 route miles make use of existing Long Island Railroad tracks. On the northerly part of the route the two North Side Division tracks west of Winfield Junction are used for 1.6 route miles, and two Main Line Division tracks between Winfield Junction and Jamaica for 4.9 route miles. On the southerly route, two existing tracks between Flatbush Avenue Station and Jamaica are used for a distance of 8.3 route miles.

The balance of the route comprising the loop in the Long Island Sector will consist for the most part, of a two track tunnel, as shown on Plate XXIII.



STUDIES MADE.

In order to consider properly the Physical Plan of this tentative scheme, the Long Island Committee made eight studies, each one representing some particular phase of the Long Island part of the suburban transit system.

Jamaica.

Three studies of Jamaica were undertaken. Jamaica, as an entry point to the suburban transit system for the major part of the potential suburban traffic, was studied in relation to its present usage and capacity in handling the estimated traffic. Certain studies included the prelimary investigation of the increased station facilities, either by the addition of platforms on the existing level or by a double decked structure.

Winfield Junction.

A study was made of rail connections that were deemed necessary for uninterrupted suburban transit service at Winfield Junction. This is the point at which the tracks of the North Side Division join those of the Main Line. As it is tentatively proposed to introduce the traffic from this line into the suburban transit system, additional tracks in the form of a jump-over were considered essential at this point.

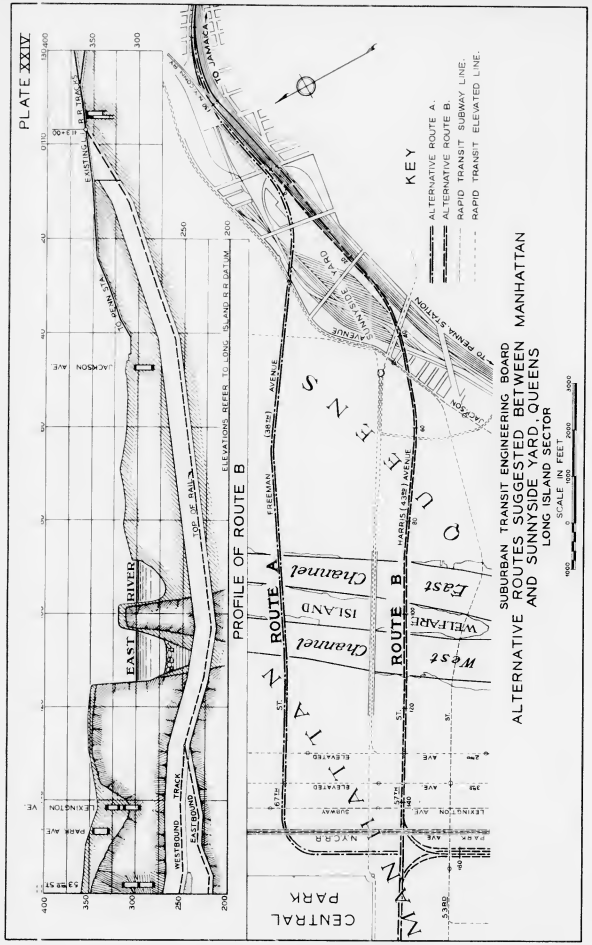
Queens-Manhattan Connection.

A study of two alternative routes for a two track tunnel between Sunnyside Yard, Queens, and midtown Manhattan was made. This connection would avoid the use of the present four under river tubes that are essential to the operation of the Pennsylvania Station. These tubes have little, if any, reserve capacity to handle any increased suburban traffic. The route tentatively adopted following Harris Avenue, Queens, and 57th Street, Manhattan crosses under the East River to the north of the present Pennsylvania Railroad tunnels. This route was chosen in preference to a more northerly one following Freeman Avenue, Queens, and 67th Street, Manhattan. The two routes studied are shown on Plate XXIV, page 48, and the southerly one, indicated as Route "B", was the route tentatively adopted by the Long Island Committee.

Flatbush Avenue, Brooklyn-Lower Manhattan Connection.

A more extensive study was required in considering a tunnel connection between the Flatbush Avenue terminus of the Atlantic Division and lower Manhattan. The existence of several subway lines in this vicinity and the proper location of the route to serve as a distributing line in Brooklyn complicated this study. Of eight alternative routes studied, two were recommended as possessing the characteristics desired. The final decision as to which to adopt is under consideration by the Suburban Transit Engineering Board as part of its Metropolitan Study. This is mainly because the two tentative routes leave lower Manhattan at two separated points, as shown on Plate XXV, page 50.

The more northerly route, A2, leaves Manhattan at Pine Street and after crossing the East River, follows Pineapple Street, Clinton Street and State Street until the Flatbush Avenue Station is reached, to the east of which a junction is made with the existing Long Island Railroad tracks. The other one, Route D1, leaves Manhattan at the Battery and after crossing the East River follows Atlantic Avenue until a junction with the existing tracks of the Long Island Railroad east of Flatbush Avenue is reached.



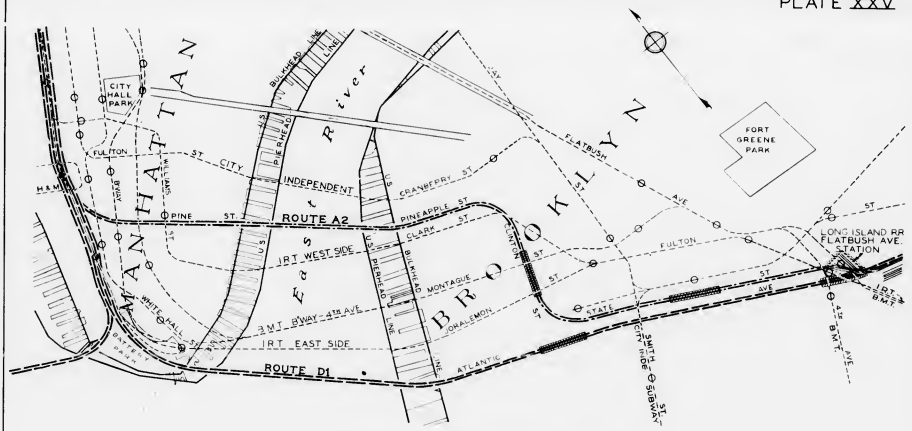
Stations.

A minor portion of the potential traffic was considered as originating west of Jamaica from stations that would be served only by the local train service of the Long Island Railroad. For this purpose it was considered best to provide transfer facilities for these passengers at the present Woodside Station on the Main Line and at Flatbush Avenue Station on the Atlantic Division. These stations would, of course, serve as transfer points where passengers having destinations not reached by the suburban transit system might change to the city rapid transit line. In Brooklyn stations are shown on each of the alternative routes west of Flatbush Ave. Other Stations would be located on the Manhattan distributing line.

TRAFFIC, CONSTRUCTION AND OPERATING COSTS.

A report is now being prepared by the Long Island Sector Planning Committee, including an estimate of potential traffic for the next ten years, and an estimate of the cost of construction and operation of the suburban transit system as outline for the Long Island Sector.

PLATE XXV



SUBURBAN TRANSIT ENGINEERING BOARD

ALTERNATIVE ROUTES SUGGESTED BETWEEN MANHATTAN AND THE LONG ISLAND R.R. FLATBUSH AVENUE STATION

LONG ISLAND SECTOR

SCALE IN FEET

1000 0 1000 2000 3000

APPENDIX A

TRAFFIC TABLES

SUBURBAN PASSENGER CENSUS, OCTOBER 26, 1927

TABLE I

TOTAL DAILY INBOUND RAILROAD PASSENGERS

WESTCHESTER AND LONG ISLAND SECTORS

Classified by Sectors and Railroads

Sectors and Railroads	Total Passengers	% Total Pass.	Through Train Passengers to Terminals	% Total Pass.	Suburban Train Passengers	% Total Pass.	Suburban Train Passengers: Miscellaneous Line Riders	% Local Train Pass.	Suburban Train Passengers: Terminal Passengers on Suburban Trains	% Local Train Pass.
Classified by Sectors										
Combined Sectors	261,562	100.00	10,952	4.19	250,610	95.81	58,367	23.29	192,243	76.71
Westchester Sector	91,650	35.04	10,952	4.19	80,698	30.85	8,552	3.41	72,146	28.79
Long Island Sector	169,912	64.96	-	-	169,912	64.96	49,815	19.88	120,097	47.92
Classified by Railroads										
New York Central Railroad	47,919	18.32	3,406	1.30	44,513	17.02	5,265	2.10	39,248	15.66
New York, New Haven & Hartford	26,977	10.31	7,546	2.89	19,431	7.43	-	-	19,431	7.76
New York, Westchester & Boston	16,754	6.41	-	-	16,754	6.40	3,287	1.31	(1)13,467	5.37
Long Island Railroad	(2)169,912	64.96	-		169,912	64.96	(2)49,815	19.88	120,097	47.92
Total Railroads	261,562	100.00	10,952	4.19	250,610	95.81	58,367	23.29	192,243	76.71

(1) 8,639 passengers to Harlem River Terminal and 4,828 passengers transferring at 180th Street.
(2) Includes Miscellaneous Line Riders on the Long Island Railroad who detrained at major discharge points in New York City, other than terminals, i.e., Nostrand Avenue 10,604; East New York 6,514; Jamaica 8,499; and Woodside 11,239 passengers.

Source: Suburban Passenger Census, October 26, 1927.

TOTAL DAILY INBOUND RAILROAD PASSENGERS

WESTCHESTER AND LONG ISLAND SECTORS

Classified by Terminals

TABLE II

TERMINALS	New York Central	% Total N.Y.C.	New York, New Haven & Hartford	% Total N.H.&H.	New York, Westchester & Boston	% Total NYW&B.	Long Island Railroad	% Total L.I.RR.	Totals	% Total
Harlem River Term. & 180th St. Station										
Suburban Train Passengers	-		-		13,467	80.38	-		13,467	5.15
Sedgwick Avenue Terminal										
Suburban Train Passengers	1,679	3.50	-		-		-		1,679	0.64
Grand Central Terminal										
Suburban Train Passengers	37,569	78.40	19,431	72.03	-		-		57,000	21.79
Thru Train "	3,406	7.11	6,879	25.50	-		-		10,285	3.93
Total Terminal "	40,975	85.51	26,310	97.53	-		-		67,285	25.72
Pennsylvania Station										
Suburban Train Passengers	-		-		-		71,281	41.95	71,281	27.25
Thru Train "	-		667	2.47	-		-		667	0.26
Total Terminal "	-		667	2.47	-		71,281	41.95	71,948	27.51
Flatbush Avenue Terminal										
Suburban Train Passengers	-		-		-		46,552	27.40	46,552	17.80
Long Island City Terminal										
Suburban Train Passengers	-		-		-		2,264	1.33	2,264	0.87
Total Suburban Train Passengers to Term.	39,248	81.90	19,431	72.03	13,467	80.38	120,097	70.68	192,243	73.50
" Thru " " " "	3,406	7.11	7,546	27.97	-		-		10,952	4.19
Total Suburban & Thru Train " " "	42,654	89.01	26,977	100.00	13,467	80.38	120,097	70.68	203,195	77.69
Miscel. Line Riders-Not Entering Term.	5,265	10.99	-		3,287	19.62	49,815	29.32	58,367	22.31
Total Railroad Passengers-All Classes	47,919	100.00	26,977	100.00	16,754	100.00	169,912	100.00	261,562	100.00

Source: Suburban Passenger Census, October 26, 1927.

RELATION OF SUBURBAN RAILROAD TRAFFIC TO METROPOLITAN AREA

WESTCHESTER AND LONG ISLAND SECTORS

Classified by Sectors, Railroads and Terminals

(192,243 Terminal Passengers on Suburban Trains)

TABLE III

Sector, Railroads, and Terminals.	Passengers Originating within N.Y.C. Limits		Passengers Between N.Y. City & Metropolitan Limits		Passengers Beyond Metropolitan Limits		Total Passengers.	
	Passengers	%	Passengers	%	Passengers	%	Passengers	%
Classified by Sectors								
Combined Sectors	75,650	39.35	110,704	57.59	5,889	3.06	192,243	100.00
Westchester Sector	10,084	13.98	60,080	83.19	2,042	2.83	72,146	100.00
Long Island Sector	65,566	54.59	50,664	42.20	3,847	3.21	120,097	100.00
Classified by Railroads								
New York Central R.R.	7,331	18.68	30,616	78.01	1,301	3.31	39,248	100.00
N.Y.N.H. & Hartford R.R.	-		18,690	96.19	741	3.81	19,431	100.00
N.Y.W. & Boston Rwy.	2,753	20.44	10,714	79.56	-		13,467	100.00
Long Island Railroad	65,566	54.59	50,684	42.20	3,847	3.21	120,097	100.00
Total Passengers	75,650	39.35	110,704	57.59	5,889	3.06	192,243	100.00
Classified by Terminals								
Harlem River & 180th Street N.Y.W. & Boston Rwy.	2,753	20.44	10,714	79.56	-		13,467	100.00
Sedgwick Avenue Terminal N.Y. Central R.R.	40	2.38	1,639	97.62	-		1,679	100.00
Grand Central Terminal								
N.Y. Central R.R.	7,291	19.41	28,977	77.13	1,301	3.46	37,569	100.00
N.Y., N.H. & H.R.R.			18,690	96.19	741	3.81	19,431	100.00
Total Grand Central Terminal	7,291	12.79	47,667	83.63	2,042	3.58	57,000	100.00
Pennsylvania Station Long Island Railroad	37,567	52.73	31,228	43.81	2,466	3.46	71,281	100.00
Flatbush Avenue Long Island Railroad	26,744	57.45	18,500	39.74	1,308	2.81	46,552	100.00
Long Island City Long Island Railroad	1,235	54.55	956	42.23	73	3.22	2,264	100.00
Total Passengers	75,650	39.35	110,704	57.59	5,889	3.06	192,243	100.00

Source: Suburban Passenger Census, October 26, 1927.

ANNULAR ZONA DISTRIBUTION FROM NEW YORK CITY TERMINALS OF DAILY INBOUND SUBURBAN PASSENGERS

WESTCHESTER AND LONG ISLAND SECTORS

Classified by Sectors, Railroads and Terminals

(192,243 Terminal Passengers on Suburban Trains)

TABLE IV

Sector, Railroads and Terminals	MILEAGE ZONE FROM NEW YORK CITY TERMINALS																			
	0 - 5		5 - 10		10 - 15		15 - 20		20 - 25		25 - 30		30 - 35		35 - 40		Beyond 40		Total	
	Pass.	%	Pass.	%	Pass.	%	Pass.	%	Pass.	%	Pass.	%	Pass.	%	Pass.	%	Pass.	%	Pass.	%
Classified by Sectors																				
Combined Sectors	1,556	0.81	37,276	19.39	59,775	31.09	49,675	25.84	19,161	9.97	6,712	3.49	7,560	3.93	3,547	1.85	6,977	3.63	192,243	100.00
Westchester Sector	697	0.97	10,337	14.33	18,233	25.27	19,292	26.74	9,363	12.98	3,717	5.15	4,931	6.83	1,325	1.84	4,251	5.89	72,146	100.00
Long Island Sector	661	0.72	26,941	22.43	41,542	34.59	30,383	25.30	9,798	8.16	2,995	2.49	2,629	2.19	2,222	1.85	2,726	2.27	120,097	100.00
Classified by Railroads																				
N.Y.C.R.R.	53	0.14	5,009	12.76	9,368	23.85	9,913	25.26	7,314	18.64	967	2.46	3,115	7.94	790	2.01	2,725	6.94	39,248	100.00
N.Y.N.H. & H.R.R.	-		-		3,334	17.16	7,421	38.19	2,049	10.55	2,750	14.15	1,616	9.35	535	2.75	1,526	7.85	19,431	100.00
N.Y.W. & B.Rwy.	644	4.78	5,328	39.56	5,537	41.12	1,956	14.54	-	-	-	-	-	-	-	-	-	-	13,467	100.00
Long Island R.R.	861	0.72	26,941	22.43	41,542	34.59	30,383	25.30	9,798	8.16	2,995	2.49	2,629	2.19	2,222	1.85	2,726	2.27	120,097	100.00
Total	1,556	0.81	37,276	19.39	59,775	31.09	49,675	25.84	19,161	9.97	6,712	3.49	7,560	3.93	3,547	1.85	6,977	3.63	192,243	100.00
Classified by Terminals																				
Harlem R. & 180th St. N.Y.W. & B.Rwy.	644	4.78	5,328	39.56	5,537	41.12	1,956	14.54	-		-		-		-		-		13,467	100.00
Sedgwick Ave. Term'l. N.Y.C.R.R.	-		12	0.71	1,136	67.66	318	18.94	118	7.03	51	3.03	8	0.49	12	0.71	24	1.43	1,679	100.00
Grand Central Term'l.																				
N.Y.C.R.R.	53	0.14	4,997	13.30	8,226	21.90	9,595	25.54	7,196	19.15	916	2.44	3,107	8.27	778	2.07	2,701	7.19	37,569	100.00
N.Y.N.H. & H.R.R.	-	-	-	-	3,334	17.16	7,421	38.19	2,049	10.55	2,750	14.15	1,616	9.35	535	2.75	1,526	7.85	19,431	100.00
Total Gr. Central Term'l.	53	0.09	4,997	8.77	11,560	20.28	17,016	29.85	9,245	16.22	3,666	6.43	4,723	8.24	1,313	2.30	4,227	7.42	57,000	100.00
Pennsylvania Station Long Island R.R.	205	0.29	12,939	18.15	24,667	34.60	21,513	30.18	5,509	7.73	1,669	2.34	1,396	1.96	1,660	2.33	1,723	2.42	71,281	100.00
Flatbush Ave. Terminal Long Island R.R.	640	1.37	13,494	28.99	16,092	34.57	8,297	17.82	4,104	8.82	1,270	2.73	1,183	2.54	520	1.11	952	2.05	46,552	100.00
Long Island City Term'l. Long Island R.R.	16	0.71	508	22.44	783	34.56	573	25.31	185	8.17	56	2.47	50	2.21	42	1.86	51	2.25	2,264	100.00
Total Terminal Passengers on Suburban Trains	1,556	0.81	37,276	19.39	59,775	31.09	49,675	25.84	19,161	9.97	6,712	3.49	7,560	3.93	3,547	1.85	6,977	3.63	192,243	100.00

Source: Suburban Passenger Census, October 26, 1927.

FACILITIES USED BY DAILY INBOUND SUBURBAN PASSENGERS TO REACH THEIR RAILROAD BOARDING STATION

WESTCHESTER AND LONG ISLAND SECTORS

Classified by Sectors, Railroads, Divisions and Branches

(192,243 Terminal Passengers on Suburban Trains)

TABLE V

Sectors, Railroads, Divisions and Branches.	Walk		Bus		Street Car		Private Auto		Taxi		Total Passengers	
	Pass.	%	Pass.	%	Pass.	%	Pass.	%	Pass.	%	Pass.	%
Classified by Sectors												
Combined Sectors	147,824	76.89	10,365	5.40	6,566	3.42	23,842	12.40	3,626	1.89	192,243	100.00
Westchester Sector	52,179	72.32	2,997	4.14	4,116	5.71	11,206	15.54	1,656	2.29	72,146	100.00
Long Island Sector	95,645	79.64	7,398	6.16	2,450	2.04	12,634	10.52	1,970	1.64	120,097	100.00
Classified by Railroads												
New York Central Railroad	30,366	77.43	1,835	4.68	1,253	3.19	4,962	12.64	810	2.06	39,246	100.00
N.Y., N.H. & Hartford R.R.	10,888	56.04	657	3.38	1,691	8.70	5,451	28.05	744	3.83	19,431	100.00
N.Y.W. & Boston Rwy. Co.	10,903	80.96	495	3.68	1,172	8.70	795	5.90	102	0.76	13,467	100.00
Long Island Railroad	95,645	79.64	7,398	6.16	2,450	2.04	12,634	10.52	1,970	1.64	120,097	100.00
Total Passengers	147,824	76.89	10,365	5.40	6,566	3.42	23,842	12.40	3,626	1.89	192,243	100.00
Classified by Divisions & Branches Expressed in Percent												
New York Central Railroad												
Harlem Division	75.75		4.40		2.21		15.77		1.87		100.00	
Hudson Division	75.24		6.01		5.35		10.40		3.00		100.00	
Putnam Div. to G.C.Term.	93.46		1.69		1.10		3.23		0.52		100.00	
Putnam Div. to Sedgwick Ave.	89.62		3.59		4.10		2.16		0.51		100.00	
Total N.Y.C. Passengers	77.43		4.68		3.19		12.64		2.06		100.00	
N.Y., N.H. & Hartford R.R.	56.04		3.38		8.70		28.05		3.83		100.00	
N.Y.W. & Boston Rwy. Co.												
Main Line	82.13		2.23		9.38		5.54		0.72		100.00	
White Plains Branch	74.52		11.11		5.51		7.76		1.00		100.00	
Total N.Y.W. & B.Rwy. Co.	80.96		3.68		8.70		5.90		0.76		100.00	
Long Island Railroad												
Atlantic Division	97.56		0.84		1.14		0.23		0.23		100.00	
Main Line "	85.74		6.61		1.98		4.78		0.89		100.00	
Montauk "	73.42		7.54		0.16		16.33		2.55		100.00	
North Side "	80.38		1.81		1.13		14.51		2.17		100.00	
Rockaway Beach Div.	79.70		5.65		14.53		1.96		1.16		100.00	
Far Rockaway Branch	83.45		1.10		1.09		12.52		1.84		100.00	
Hempstead "	72.94		8.98		1.59		15.77		0.72		100.00	
Long Beach "	75.38		16.62		0.75		5.25		2.00		100.00	
Oyster Bay "	55.15		20.21		-		22.33		2.31		100.00	
Wading River "	36.39		18.06		-		42.48		3.07		100.00	
West Hempstead "	93.97		2.56		-		3.47		-		100.00	
Whitestone "	91.35		1.27		0.41		3.98		2.99		100.00	
Total L.I.R.R. Passengers.	79.64		6.16		2.04		10.52		1.64		100.00	
Total Railroad Passengers	76.89		5.40		3.42		12.40		1.89		100.00	

Source: Suburban Passenger Census, October 26, 1927.

TYPES OF RAILROAD TICKETS USED

WESTCHESTER AND LONG ISLAND SECTORS

Classified by Sectors, Railroads and Terminals

(192,243 Terminal Passengers on Suburban Trains)

TABLE VI

Sectors, Railroads and Terminals	Monthly Commutation		One Way		Round Trip		25 Trip		50 Trip		School		Employee & Pass		Pass		Total	
	Pass.	%	Pass.	%	Pass.	%	Pass.	%	Pass.	%	Pass.	%	Pass.	%	Pass.	%	Pass.	%
Classified by Sectors																		
Combined Sectors	141,925	73.82	17,637	9.17	6,213	3.23	1,213	0.63	14,216	7.40	3,669	1.91	1,165	0.61	6,203	3.23	192,243	100.00
Westchester Sector	46,801	67.85	8,623	11.95	945	1.31	1,213	1.68	7,004	9.82	1,219	1.69	371	0.51	3,890	5.39	72,146	100.00
Long Island Sector	95,124	77.54	9,014	7.50	5,268	4.39	-	-	7,134	5.94	2,450	2.04	794	0.66	2,313	1.93	120,097	100.00
Classified by Railroads																		
New York Central R.R.	26,013	66.32	1,177	3.00	490	1.25	50	0.13	6,446	16.42	493	1.26	286	0.73	3,491	8.89	39,246	100.00
N.Y.N.H. & Hartford	15,543	79.99	991	5.10	455	2.34	1,163	5.99	636	3.28	291	1.50	82	0.42	266	1.36	19,431	100.00
N.Y.W. & Boston	6,445	47.86	6,455	47.93	-	-	-	-	-	-	435	3.23	1	0.01	131	0.97	13,467	100.00
Long Island R.R.	95,124	77.54	9,014	7.50	5,268	4.39	-	-	7,134	5.94	2,450	2.04	794	0.66	2,313	1.93	120,097	100.00
Total Passengers	141,925	73.82	17,637	9.17	6,213	3.23	1,213	0.63	14,216	7.40	3,669	1.91	1,165	0.61	6,203	3.23	192,243	100.00
Classified by Terminals																		
Harlem R. & 180th St. N.Y., W. & B.	6,445	47.86	6,455	47.93	-	-	-	-	-	-	435	3.23	1	0.01	131	0.97	13,467	100.00
Sedgwick Ave. Term. N.Y.Central	1,063	63.30	87	5.20	13	0.78	2	0.13	401	23.86	23	1.37	25	1.50	65	3.84	1,679	100.00
Grand Central Term. N.Y.Central	41,893	72.44	2,091	3.65	932	1.64	1,211	2.12	6,683	11.72	761	1.34	345	0.61	3,644	6.46	57,000	100.00
N.Y.N.H. & H.	15,750	80.54	1,090	5.90	477	1.27	48	0.13	6,045	16.09	470	1.25	263	0.70	3,423	9.12	37,569	100.00
	15,543	79.99	991	5.10	455	2.34	1,163	5.99	636	3.28	291	1.50	82	0.42	266	1.36	19,431	100.00
Pennsylvania Station Long Island R.R.	56,647	79.47	2,230	3.14	3,366	4.75	-	-	6,030	8.46	1,240	1.74	599	0.84	1,141	1.60	71,261	100.00
Flatbush Ave. Term. Long Island R.R.	34,751	74.65	6,722	14.44	1,871	4.02	-	-	992	2.13	1,201	2.58	191	0.41	824	1.77	46,552	100.00
Long Island City Term. Long Island R.R.	1,726	76.43	54	2.39	11	0.49	-	-	112	4.93	9	0.39	4	0.20	340	15.37	2,264	100.00
Total Passengers	141,925	73.82	17,637	9.17	6,213	3.23	1,213	0.63	14,216	7.40	3,669	1.91	1,165	0.61	6,203	3.23	192,243	100.00

Source: Suburban Passenger Census, October 26, 1927.

HALF-HOURLY PASSENGER LOAD ON NEW YORK CITY TERMINALS
WESTCHESTER AND LONG ISLAND SECTORS
Classified by Sectors

TABLE VII

HALF - HOURLY PERIODS	HALF-HOURLY PASSENGER LOAD BY SECTORS								
	COMBINED SECTORS			WESTCHESTER SECTOR			LONG ISLAND SECTOR		
	Passengers	%	Accum. %	Passengers	%	Accum. %	Passengers	%	Accum. %
12:00 - 12:29 A.M.	898	0.46	0.46	216	0.30	0.30	682	0.57	0.57
12:30 - 12:59 A.M.	291	0.15	0.61	69	0.12	0.42	206	0.17	0.74
1:00 - 1:29 A.M.	256	0.13	0.74	60	0.08	0.50	196	0.16	0.90
1:30 - 1:59 A.M.	26	0.01	0.75	-	-	0.50	26	0.02	0.92
2:00 - 2:29 A.M.	13	0.01	0.76	13	0.02	0.52	-	-	0.92
2:30 - 2:59 A.M.	84	0.04	0.80	-	-	0.52	84	0.07	0.99
3:00 - 3:29 A.M.	20	0.01	0.81	-	-	0.52	20	0.02	1.01
3:30 - 3:59 A.M.	5	0.01	0.82	-	-	0.52	5	0.01	1.02
4:00 - 4:29 A.M.	36	0.02	0.84	36	0.05	0.57	-	-	1.02
4:30 - 4:59 A.M.	132	0.07	0.91	-	-	0.57	132	0.11	1.13
5:00 - 5:29 A.M.	36	0.02	0.93	-	-	0.57	36	0.03	1.16
5:30 - 5:59 A.M.	476	0.25	1.18	-	-	0.57	476	0.40	1.56
6:00 - 6:29 A.M.	1,137	0.59	1.77	192	0.21	0.78	945	0.78	2.34
6:30 - 6:59 A.M.	2,348	1.22	2.99	508	0.76	1.54	1,840	1.53	3.87
7:00 - 7:29 A.M.	8,359	4.35	7.34	1,292	1.79	3.33	7,067	5.88	9.75
7:30 - 7:59 A.M.	17,997	9.36	16.70	3,970	5.50	8.83	14,017	11.67	21.42
8:00 - 8:29 A.M.	39,916	20.76	37.46	14,754	20.45	29.28	25,162	20.95	42.37
8:30 - 8:59 A.M.	35,960	18.71	56.17	16,474	22.83	52.11	19,486	16.23	58.60
9:00 - 9:29 A.M.	18,791	9.77	65.94	8,894	12.33	64.44	9,897	8.24	66.84
9:30 - 9:59 A.M.	6,548	3.41	69.35	2,639	3.66	68.10	3,909	3.25	70.09
10:00 - 10:29 A.M.	5,060	2.63	72.50	2,926	4.06	72.16	2,134	1.78	71.87
10:30 - 10:59 A.M.	3,676	1.91	74.52	1,092	1.51	73.67	2,584	2.15	73.02
11:00 - 11:29 A.M.	3,471	1.81	76.33	1,388	1.84	75.51	2,143	1.78	75.80
11:30 - 11:59 A.M.	2,414	1.26	77.59	1,263	1.75	77.26	1,151	0.96	77.76
12:00 - 12:29 P.M.	1,839	0.96	78.55	611	0.85	78.11	1,228	1.02	78.78
12:30 - 12:59 P.M.	3,011	1.57	80.12	1,406	1.95	80.06	1,606	1.34	80.12
1:00 - 1:29 P.M.	2,161	1.12	81.24	583	0.81	80.87	1,566	1.31	81.43
1:30 - 1:59 P.M.	2,973	1.55	82.79	1,389	1.54	82.71	1,544	1.37	82.80
2:00 - 2:29 P.M.	1,064	0.55	83.34	535	0.74	83.45	529	0.44	83.24
2:30 - 2:59 P.M.	1,888	0.98	84.32	541	0.75	84.20	1,357	1.07	84.31
3:00 - 3:29 P.M.	1,962	1.02	85.31	636	0.86	85.06	1,327	1.10	85.41
3:30 - 3:59 P.M.	1,660	0.87	86.18	566	0.81	85.89	1,094	0.91	86.32
4:00 - 4:29 P.M.	2,183	1.14	87.32	551	0.76	86.65	1,632	1.36	87.68
4:30 - 4:59 P.M.	1,604	0.83	88.15	873	1.21	87.86	731	0.61	88.29
5:00 - 5:29 P.M.	3,970	2.06	90.21	1,538	2.12	89.98	2,436	2.03	90.32
5:30 - 5:59 P.M.	3,490	1.82	92.03	1,636	2.27	92.25	1,854	1.54	91.86
6:00 - 6:29 P.M.	2,952	1.54	93.57	1,154	1.60	93.85	1,798	1.50	93.36
6:30 - 6:59 P.M.	2,880	1.19	94.76	1,833	1.74	95.59	1,032	0.86	94.22
7:00 - 7:29 P.M.	1,375	0.71	95.47	316	0.44	96.03	1,057	0.88	95.10
7:30 - 7:59 P.M.	2,867	1.49	96.96	1,032	1.43	97.46	1,835	1.53	96.63
8:00 - 8:29 P.M.	754	0.39	97.35	254	0.35	97.81	500	0.42	97.05
8:30 - 8:59 P.M.	795	0.41	97.76	214	0.30	98.11	581	0.48	97.53
9:00 - 9:29 P.M.	594	0.36	98.12	170	0.24	98.35	324	0.44	97.97
9:30 - 9:59 P.M.	565	0.30	98.42	229	0.32	98.67	356	0.30	98.27
10:00 - 10:29 P.M.	885	0.46	98.88	227	0.31	98.98	658	0.55	98.82
10:30 - 10:59 P.M.	686	0.36	99.24	307	0.43	99.41	381	0.32	99.14
11:00 - 11:29 P.M.	948	0.49	99.73	234	0.32	99.73	714	0.59	99.73
11:30 - 11:59 P.M.	519	0.27	100.00	193	0.27	100.00	326	0.27	100.00
Totals	192,243	100.00	-	72,146	100.00	-	120,097	100.00	-

Source: Suburban Passenger Census, October 26, 1927.

HALF-HOURLY PASSENGER LOAD ON NEW YORK CITY TERMINALS
WESTCHESTER AND LONG ISLAND SECTORS
Classified by Railroads
(192,243 Terminal Passengers on Suburban Trains)

TABLE VIII

HALF - HOURLY PERIODS	HALF-HOURLY PASSENGER LOAD BY RAILROADS														
	COMBINED RailROADS			N.Y. CENTRAL R.R.			N.Y., N.H. & H.R.R.			N.Y., W. & B. Swy. Co.			LONG ISLAND R.R.		
	Passengers	%	Accum.%	Passengers	%	Accum.%	Passengers	%	Accum.%	Passengers	%	Accum.%	Passengers	%	Accum.%
12:00 - 12:29 A.M.	898	0.46	0.46	53	0.14	0.14	90	0.46	0.46	73	0.54	0.54	682	0.57	0.57
12:30 - 12:59 A.M.	291	0.15	0.61	56	0.15	0.29	-	-	0.46	27	0.20	0.74	206	0.17	0.74
1:00 - 1:29 A.M.	256	0.13	0.74	-	-	0.29	-	-	0.46	60	0.45	1.19	196	0.16	0.90
1:30 - 1:59 A.M.	26	0.01	0.75	-	-	0.29	-	-	0.46	-	-	1.19	26	0.02	0.92
2:00 - 2:29 A.M.	13	0.01	0.76	-	-	0.29	-	-	0.46	13	0.10	1.29	-	-	0.92
2:30 - 2:59 A.M.	84	0.04	0.80	-	-	0.29	-	-	0.46	-	-	1.29	84	0.07	0.99
3:00 - 3:29 A.M.	20	0.01	0.81	-	-	0.29	-	-	0.46	-	-	1.29	20	0.02	1.01
3:30 - 3:59 A.M.	5	0.01	0.82	-	-	0.29	-	-	0.46	-	-	1.29	5	0.01	1.02
4:00 - 4:29 A.M.	36	0.02	0.84	-	-	0.29	-	-	0.46	36	0.28	1.57	-	-	1.02
4:30 - 4:59 A.M.	132	0.07	0.91	-	-	0.29	-	-	0.46	-	-	1.57	132	0.11	1.13
5:00 - 5:29 A.M.	36	0.02	0.93	-	-	0.29	-	-	0.46	-	-	1.57	36	0.03	1.16
5:30 - 5:59 A.M.	476	0.25	1.18	-	-	0.29	-	-	0.46	-	-	1.57	476	0.40	1.56
6:00 - 6:29 A.M.	1,137	0.59	1.77	186	0.32	0.61	-	-	0.46	66	0.49	2.06	945	0.78	2.34
6:30 - 6:59 A.M.	2,340	1.22	2.99	172	0.44	1.05	103	0.53	0.99	233	1.73	3.79	1,840	1.53	3.87
7:00 - 7:29 A.M.	8,359	4.35	7.34	306	0.76	1.81	548	1.26	2.25	738	5.48	9.27	7,067	5.88	9.75
7:30 - 7:59 A.M.	17,997	9.36	16.70	2,355	6.00	7.83	320	1.65	3.92	1,295	9.62	18.89	14,017	11.67	21.42
8:00 - 8:29 A.M.	39,916	20.76	37.46	9,371	23.88	31.71	3,280	17.08	21.00	2,063	15.32	34.21	25,162	20.95	42.37
8:30 - 8:59 A.M.	35,960	18.71	56.17	10,040	25.71	57.42	5,450	28.15	49.05	934	6.94	41.15	19,486	16.23	58.60
9:00 - 9:29 A.M.	18,791	9.77	65.94	5,020	12.79	70.21	3,490	17.95	67.01	384	2.85	44.00	9,897	8.24	66.84
9:30 - 9:59 A.M.	6,548	3.41	69.35	964	2.51	72.72	1,152	5.93	72.94	503	3.74	47.74	3,909	3.25	70.09
10:00 - 10:29 A.M.	5,060	3.15	72.50	1,308	3.31	76.03	1,358	6.98	79.92	269	2.00	49.74	2,134	2.61	72.70
10:30 - 10:59 A.M.	3,676	2.02	74.52	641	1.63	77.66	-	-	79.92	451	3.35	53.09	2,584	2.32	75.02
11:00 - 11:29 A.M.	3,471	1.81	76.33	402	1.02	78.68	656	3.38	83.30	270	2.00	55.09	2,143	1.78	76.80
11:30 - 11:59 A.M.	2,414	1.26	77.59	777	1.96	80.64	213	1.10	84.40	273	2.03	57.12	1,151	0.96	77.76
12:00 - 12:29 P.M.	1,839	0.96	78.55	427	1.09	81.75	-	-	84.40	184	1.37	58.49	1,228	1.02	78.78
12:30 - 12:59 P.M.	3,011	1.57	80.12	708	1.80	83.55	429	2.21	86.61	269	2.00	60.49	1,606	1.34	80.12
1:00 - 1:29 P.M.	2,161	1.12	81.24	90	0.23	83.78	286	1.47	88.08	207	1.54	62.03	1,566	1.31	81.43
1:30 - 1:59 P.M.	2,973	1.55	82.79	663	1.69	85.47	419	2.16	90.24	247	1.83	63.86	1,544	1.37	82.80
2:00 - 2:29 P.M.	1,064	0.53	83.34	333	0.85	86.32	-	-	90.24	202	1.50	65.36	529	0.44	83.24
2:30 - 2:59 P.M.	1,888	0.93	84.29	270	0.69	87.01	-	-	90.24	271	2.01	67.37	1,357	1.07	84.31
3:00 - 3:29 P.M.	1,962	1.02	85.31	176	0.43	87.46	309	1.59	91.83	150	1.11	68.48	1,327	1.10	85.41
3:30 - 3:59 P.M.	1,660	0.87	86.18	315	0.80	88.26	-	-	91.83	271	2.01	70.49	1,094	0.91	86.32
4:00 - 4:29 P.M.	2,183	1.14	87.32	401	1.02	89.28	-	-	91.83	150	1.11	71.60	1,632	1.36	87.68
4:30 - 4:59 P.M.	1,604	0.83	88.15	193	0.49	89.77	342	1.76	93.59	338	2.51	74.11	731	0.61	88.29
5:00 - 5:29 P.M.	3,970	2.06	90.21	778	1.98	91.75	-	-	93.59	754	5.60	79.71	2,436	2.03	90.32
5:30 - 5:59 P.M.	3,490	1.82	92.03	489	1.25	93.00	445	2.29	95.88	708	5.21	84.92	1,854	1.54	91.86
6:00 - 6:29 P.M.	2,952	1.54	93.57	607	2.06	95.06	-	-	95.88	347	2.58	87.50	1,798	1.50	93.36
6:30 - 6:59 P.M.	2,880	1.19	94.76	535	1.36	96.42	372	1.91	97.79	345	2.56	90.06	1,032	0.86	94.22
7:00 - 7:29 P.M.	1,375	0.71	95.47	75	0.19	96.61	-	-	97.79	243	1.80	91.86	1,057	0.88	95.10
7:30 - 7:59 P.M.	2,867	1.49	96.96	618	1.57	98.18	154	0.79	98.58	260	1.93	93.79	1,835	1.53	96.63
8:00 - 8:29 P.M.	754	0.39	97.35	2	0.01	98.19	86	0.44	99.02	166	1.23	95.02	500	0.42	97.05
8:30 - 8:59 P.M.	795	0.41	97.76	67	0.17	98.36	-	-	99.02	147	1.09	96.11	581	0.48	97.53
9:00 - 9:29 P.M.	594	0.36	98.12	53	0.13	98.49	58	0.27	99.29	65	0.48	96.59	324	0.44	97.97
9:30 - 9:59 P.M.	565	0.30	98.42	116	0.30	98.79	33	0.17	99.46	60	0.59	97.18	356	0.30	98.27
10:00 - 10:29 P.M.	885	0.46	98.88	124	0.32	99.11	-	-	99.46	101	0.75	97.93	658	0.55	98.82
10:30 - 10:59 P.M.	686	0.36	99.24	146	0.37	99.48	106	0.54	100.00	55	0.41	98.34	381	0.32	99.14
11:00 - 11:29 P.M.	948	0.49	99.73	183	0.31	99.79	-	-	100.00	111	0.83	99.17	714	0.59	99.73
11:30 - 11:59 P.M.	519	0.27	100.00	61	0.21	100.00	-	-	100.00	112	0.83	100.00	326	0.27	100.00
Totals	192,243	100.00	-	39,246	100.00	-	19,431	100.00	-	13,467	100.00	-	120,097	100.00	-

Source: Suburban Passenger Census, October 26, 1927.

HALF-HOURLY PASSENGER LOAD ON NEW YORK CITY TERMINALS
WESTCHESTER AND LONG ISLAND SECTORS

Classified by Terminals

(146,243 Terminal Passengers on Suburban Trains)

TABLE IA

Half - Hourly Periods	HALF-HOURLY PASSENGERS BY TERMINALS																					
	Total Terminal Passengers.			Harlem River & 130th Street.			Sedgwick Ave. Terminal.			Grand Central Terminal.			Pennsylvania Station.			Flatbush Ave. Terminal.			Long Island City.		
	Pass.	%	Accum.%	Pass.	%	Accum.%	Pass.	%	Accum.%	Pass.	%	Accum.%	Pass.	%	Accum.%	Pass.	%	Accum.%	Pass.	%	Accum.%
12:00 - 12:29 A.M.	896	0.46	0.46	73	0.54	0.54	-	-	-	143	0.25	0.25	378	0.52	0.52	310	0.67	0.67	-	-	-
12:30 - 12:59 A.M.	591	0.31	0.61	27	0.20	0.74	-	-	-	56	0.10	0.35	68	0.10	0.62	136	0.30	0.97	-	-	-
1:00 - 1:29 A.M.	256	0.13	0.74	60	0.45	1.19	-	-	-	-	-	0.35	160	0.22	0.84	38	0.08	1.05	-	-	-
1:30 - 1:59 A.M.	26	0.01	0.75	-	-	1.19	-	-	-	-	-	0.35	26	0.04	0.88	-	-	1.05	-	-	-
2:00 - 2:29 A.M.	13	0.01	0.76	13	0.10	1.29	-	-	-	-	-	0.35	-	-	0.88	-	-	1.05	-	-	-
2:30 - 2:59 A.M.	84	0.04	0.80	-	-	1.29	-	-	-	-	-	0.35	39	0.05	0.93	45	0.10	1.15	-	-	-
3:00 - 3:29 A.M.	20	0.01	0.81	-	-	1.29	-	-	-	-	-	0.35	20	0.03	0.96	-	-	1.15	-	-	-
3:30 - 3:59 A.M.	5	0.01	0.82	-	-	1.29	-	-	-	-	-	0.35	5	0.01	0.97	-	-	1.15	-	-	-
4:00 - 4:29 A.M.	38	0.02	0.84	36	0.28	1.57	-	-	-	-	-	0.35	-	-	0.97	-	-	1.15	-	-	-
4:30 - 4:59 A.M.	132	0.07	0.91	-	-	1.57	-	-	-	-	-	0.35	105	0.15	1.12	27	0.06	1.21	-	-	-
5:00 - 5:29 A.M.	36	0.02	0.93	-	-	1.57	-	-	-	-	-	0.35	-	-	1.12	36	0.07	1.28	-	-	-
5:30 - 5:59 A.M.	478	0.25	1.18	-	-	1.57	-	-	-	-	-	0.35	220	0.31	1.43	256	0.55	1.83	-	-	-
6:00 - 6:29 A.M.	1,137	0.59	1.77	66	0.49	2.06	36	2.26	2.26	88	0.15	0.50	342	0.48	1.91	603	1.30	3.13	-	-	-
6:30 - 6:59 A.M.	2,348	1.22	2.99	235	1.73	3.79	37	1.61	3.87	249	0.44	0.94	698	0.98	2.89	1,106	2.38	5.51	34	1.50	1.50
7:00 - 7:29 A.M.	6,359	4.35	7.34	736	5.48	9.27	116	5.91	10.78	439	0.77	1.71	3,240	4.55	7.44	3,295	7.29	12.80	458	19.96	20.58
7:30 - 7:59 A.M.	17,987	9.36	16.70	1,295	9.62	18.89	349	20.79	31.57	2,326	4.08	5.79	7,663	10.76	18.22	5,553	11.93	24.73	781	34.50	55.08
8:00 - 8:29 A.M.	59,916	20.76	37.46	3,063	12.32	34.21	407	24.24	55.81	12,894	21.56	27.34	13,360	18.77	36.99	11,109	23.86	48.59	673	29.73	84.81
8:30 - 8:59 A.M.	35,960	18.71	56.17	934	6.94	41.15	218	12.63	68.44	15,388	26.69	54.03	14,210	19.94	56.93	5,276	11.33	59.92	-	-	84.81
9:00 - 9:29 A.M.	16,791	9.77	65.94	384	2.85	44.00	106	6.43	74.87	8,408	14.74	68.77	6,303	8.84	65.77	3,656	7.66	67.58	38	1.24	86.05
9:30 - 9:59 A.M.	6,548	3.41	69.35	503	3.74	47.74	32	1.90	76.77	2,104	3.69	72.46	2,606	3.65	69.42	1,301	2.79	70.37	3	0.15	86.18
10:00 - 10:29 A.M.	5,060	3.15	72.50	269	2.00	49.74	26	1.55	78.32	2,631	4.62	77.08	1,150	3.02	72.44	966	2.08	72.45	18	0.80	86.98
10:30 - 10:59 A.M.	3,878	2.03	74.52	451	5.35	53.09	9	0.54	78.86	632	1.11	78.19	1,904	2.67	75.11	864	1.86	74.31	16	0.71	87.69
11:00 - 11:29 A.M.	3,471	1.61	76.13	270	2.00	55.09	62	3.69	82.55	996	1.75	80.14	1,237	1.73	76.84	906	1.95	76.26	-	-	87.69
11:30 - 11:59 A.M.	2,414	1.28	77.59	273	2.03	57.12	11	0.65	83.20	979	1.72	81.86	833	1.17	78.01	504	0.65	76.91	14	0.62	88.31
12:00 - 12:29 P.M.	1,839	0.96	78.55	184	1.37	58.49	12	0.71	83.91	415	0.73	82.59	787	1.10	79.11	441	0.95	77.86	-	-	88.31
12:30 - 12:59 P.M.	3,011	1.57	80.12	269	2.00	60.49	-	-	83.91	1,137	2.00	84.59	1,050	1.47	80.58	506	1.09	78.95	47	2.06	90.37
1:00 - 1:29 P.M.	2,181	1.13	81.24	207	1.54	62.03	27	1.61	85.52	349	0.61	85.20	975	1.23	81.81	593	1.49	80.44	-	-	90.39
1:30 - 1:59 P.M.	2,973	1.55	82.79	247	1.83	63.86	21	1.25	86.77	1,061	1.86	87.06	1,257	1.76	83.57	379	0.81	81.25	8	0.34	90.73
2:00 - 2:29 P.M.	1,064	0.55	83.34	202	1.50	65.36	5	0.30	87.07	328	0.56	87.64	288	0.38	83.89	301	0.65	81.90	-	-	90.73
2:30 - 2:59 P.M.	1,585	0.90	84.24	471	3.01	67.37	4	0.24	87.31	266	0.47	88.11	939	1.32	85.21	324	0.70	82.60	24	1.06	91.79
3:00 - 3:29 P.M.	1,962	1.02	85.31	150	1.11	68.48	4	0.24	87.55	401	0.84	88.95	512	0.75	85.96	769	1.69	84.29	19	0.84	92.63
4:00 - 4:29 P.M.	1,660	0.87	86.18	271	2.01	70.49	3	0.18	87.73	312	0.55	89.50	784	1.10	87.04	299	0.64	84.93	11	0.48	93.11
4:30 - 4:59 P.M.	2,183	1.14	87.32	150	1.11	71.60	45	2.74	90.47	325	0.62	90.12	1,078	1.51	88.55	534	1.14	86.07	20	0.88	93.99
5:00 - 5:29 P.M.	1,604	0.83	88.15	336	2.51	74.11	12	0.71	91.18	523	0.98	91.04	426	0.60	89.15	291	0.63	86.70	14	0.62	94.61
5:30 - 5:59 P.M.	3,970	2.06	90.21	754	5.60	79.71	-	-	91.18	774	1.36	92.40	1,127	1.58	90.73	1,311	2.82	89.52	-	-	94.61
6:00 - 6:29 P.M.	2,490	1.68	92.03	703	5.21	84.92	50	2.98	94.16	694	1.55	93.95	1,106	1.55	92.28	731	1.57	91.09	15	0.66	95.27
6:30 - 6:59 P.M.	2,952	1.54	93.57	347	2.58	87.50	13	0.77	94.93	794	1.39	95.34	789	1.11	93.39	948	2.08	93.11	57	2.96	98.25
7:00 - 7:29 P.M.	1,376	0.71	95.47	343	1.90	91.86	13	0.77	95.70	498	1.58	96.92	537	0.75	94.14	485	1.04	94.15	6	0.27	98.52
7:30 - 7:59 P.M.	2,867	1.49	96.96	260	1.93	93.79	57	2.20	98.44	735	1.29	98.23	1,154	0.75	94.89	523	1.12	95.27	-	-	98.50
8:00 - 8:29 P.M.	754	0.39	97.35	166	1.23	95.02	2	0.12	98.56	66	0.15	98.47	256	0.36	95.07	237	0.51	97.24	5	0.22	98.72
8:30 - 8:59 P.M.	795	0.41	97.76	147	1.09	96.11	3	0.18	98.74	94	0.11	98.58	398	0.56	95.63	177	0.38	97.62	6	0.27	98.99
9:00 - 9:29 P.M.	694	0.36	98.12	65	0.46	96.57	-	-	98.74	105	0.18	98.76	253	0.35	97.98	271	0.58	98.20	-	-	98.99
9:30 - 9:59 P.M.	585	0.30	98.42	80	0.59	97.16	5	0.36	99.10	143	0.25	99.01	351	0.49	98.47	-	-	98.20	5	0.22	99.21
10:00 - 10:29 P.M.	895	0.46	98.88	101	0.75	97.91	5	0.30	99.40	121	0.21	99.22	370	0.52	98.79	298	0.63	98.83	-	-	99.21
10:30 - 10:59 P.M.	696	0.36	99.24	55	0.41	98.34	-	-	99.40	253	0.44	99.66	206	0.29	99.08	175	0.38	99.20	-	-	99.21
11:00 - 11:29 P.M.	240	0.49	99.75	111	0.83	99.17	8	0.48	99.88	115	0.20	99.86	405	0.57	99.65	291	0.63	99.83	18	0.79	100.00
11:30 - 11:59 P.M.	519	0.27	100.00	112	0.83	100.0	2	0.12	100.00	78	0.14	100.00	246	0.35	100.00	76	0.17	100.00	-	-	100.00
Totals	192,243	100.00	-	13,467	100.00	-	1,679	100.00	-	57,000	100.00	-	71,281	100.00	-	46,552	100.00	-	2,264	100.00	-

Source: Suburban Passenger Census, October 26, 1927.

ULTIMATE DESTINATION OF DAILY INBOUND SUBURBAN PASSENGERS
WESTCHESTER AND LONG ISLAND SECTORS

Classified by Sectors, Railroads and Terminals

(192,243 Terminal Passengers on Suburban Trains)

TABLE X

Sectors, Railroads and Terminals	Total Term. Passengers on Suburban Trains	Pass. with Destination in Manhattan	BROOKLYN						QUEENS								ELSEWHERE							
			Wmsburg. Section		Atlantic Ave. Section		So. Brklyn. Section		Total		Flush'g. Section		Jamaica Section		Long Island City		Total		Bronx		Staten Island		New Jersey		Elsewhere		Total	
	Pass.	%	Pass.	%	Pass.	%	Pass.	%	Pass.	%	Pass	%	Pass	%	Pass.	%	Pass.	%	Pass.	%	Pass	%	Pass.	%	Pass	%	Pass.	%
Classified by Sectors																												
Combined Sectors	192,243	100.00	160,617	86.66	1,440	0.75	13,497	7.02	5,887	3.06	20,824	10.83	439	0.23	537	0.28	3,122	1.62	4,098	2.13	3,648	1.90	186	0.09	2,039	1.06	631	0.33	6,504	3.38
Westchester Sector	72,146	100.00	64,961	89.99	569	0.79	1,249	1.80	609	0.84	2,477	3.43	149	0.21	167	0.23	983	1.36	1,299	1.80	2,279	3.15	68	0.09	733	1.02	569	0.78	3,449	4.76
Long Island Sector	120,097	100.00	95,656	79.65	871	0.73	12,198	10.16	5,278	4.39	18,347	15.28	290	0.24	370	0.31	2,139	1.78	2,799	2.33	1,369	1.14	118	0.10	1,306	1.08	62	0.05	3,055	2.54
Classified by Railroads																												
N.Y.C.R.R.	59,246	100.00	38,290	92.46	250	0.64	657	1.67	255	0.65	1,162	2.96	99	0.25	104	0.26	539	1.38	742	1.89	335	0.85	51	0.13	467	1.19	201	0.52	1,054	2.69
N.Y.N.H. & H.R.R.	19,431	100.00	18,338	94.37	105	0.55	360	1.85	152	0.78	617	3.18	23	0.12	36	0.20	187	0.96	248	1.28	32	0.16	7	0.04	124	0.64	65	0.33	228	1.17
N.Y.W. & B.Ry. Co.	13,467	100.00	10,893	76.43	214	1.50	882	6.09	328	1.50	1,143	8.19	27	0.20	22	0.19	257	1.90	309	2.29	1,918	14.20	10	0.06	142	1.05	103	0.76	2,167	16.09
Total Long Island R.R.	120,097	100.00	95,656	79.65	871	0.73	12,198	10.16	5,278	4.39	18,347	15.28	290	0.24	370	0.31	2,139	1.78	2,799	2.33	1,369	1.14	118	0.10	1,306	1.08	62	0.05	3,055	2.54
Total Passengers	192,243	100.00	160,617	83.66	1,440	0.75	13,497	7.02	5,887	3.06	20,824	10.83	439	0.23	537	0.28	3,122	1.62	4,098	2.13	3,648	1.90	186	0.09	2,039	1.06	631	0.33	6,504	3.38
Classified by Terminals																												
Harlem R. & 130th St. N.Y. & H.Ry. Co.	13,467	100.00	10,893	76.43	214	1.50	882	6.09	328	1.50	998	5.19	27	0.20	25	0.19	257	1.90	309	2.29	1,918	14.20	10	0.06	142	1.05	103	0.76	2,167	16.09
Sedgwick Ave. Terminal N.Y.C.R.R.	1,679	100.00	1,459	86.90	-	-	15	0.89	4	0.24	19	1.15	2	0.12	2	0.12	1	0.06	5	0.30	173	10.30	-	-	15	0.89	8	0.48	196	11.67
Grand Central Terminal N.Y.C.R.R.	37,569	100.00	34,831	92.72	250	0.66	642	1.71	251	0.67	1,143	3.04	97	0.26	108	0.27	536	1.43	737	1.96	162	0.43	51	0.14	458	1.22	193	0.51	862	2.29
N.Y.N.H. & H.R.R.	19,431	100.00	18,338	94.37	105	0.55	360	1.85	152	0.78	617	3.18	23	0.12	36	0.20	187	0.96	248	1.28	32	0.16	7	0.04	124	0.64	65	0.33	228	1.17
Total Grand Central Terminal	57,000	100.00	53,169	93.28	355	0.62	1,002	1.76	403	0.71	1,760	3.09	120	0.21	144	0.25	723	1.27	985	1.73	194	0.34	58	0.10	582	1.02	258	0.23	1,090	1.91
Pennsylvania Station Long Island R.R.	71,281	100.00	67,555	94.92	122	0.17	619	0.87	203	0.28	944	1.32	212	0.30	159	0.22	146	0.21	519	0.73	1,081	1.43	34	0.05	958	1.34	150	0.21	2,163	3.03
Flatbush Ave. Term. Long Island R.R.	46,552	100.00	28,118	60.40	660	1.42	11,553	24.82	5,067	10.88	17,280	37.12	48	0.09	177	0.39	67	0.14	288	0.62	348	0.75	84	0.18	348	0.75	66	0.14	846	1.82
Long Island City Term. Long Island R.R.	2,264	100.00	123	5.43	69	3.93	26	1.15	8	0.35	125	5.43	36	1.59	34	1.51	1,934	84.98	1,994	88.00	-	-	-	-	-	-	24	1.06	24	1.06
Total Terminal Passengers on Suburban Trains	192,243	100.00	160,617	83.66	1,440	0.75	13,497	7.08	5,887	3.06	20,824	10.83	439	0.23	537	0.28	3,122	1.62	4,098	2.13	3,648	1.90	186	0.09	2,039	1.06	631	0.33	6,504	3.38

Source: Suburban Passenger Census, October 26, 1927.

DAILY INBOUND TERMINAL PASSENGERS CLASSIFIED AS TO DESTINATIONS IN MANHATTAN AND ELSEWHERE
WESTCHESTER AND LONG ISLAND SECTORS

Classified by Sectors, Railroads and Terminals
(192,243 Terminal Passengers on Suburban Trains)

TABLE XI

Sectors, Railroads and Terminals	Total Terminal Passengers on Suburban Trains.		Passengers with Destination in Manhattan.		Passengers with Destination Elsewhere.	
	Passengers	%	Passengers	%	Passengers	%
Classified by Sectors						
Combined Sectors	192,243	100.00	160,817	83.65	31,426	16.35
Westchester Sector	72,146	100.00	64,921	89.99	7,225	10.01
Long Island Sector	120,097	100.00	95,896	79.85	24,201	20.15
Classified by Railroads						
New York Central Railroad	39,248	100.00	36,290	92.46	2,958	7.54
New York, New Haven & Hartford R.R.	19,431	100.00	18,338	94.37	1,093	5.63
New York, Westchester & Boston Railway	13,467	100.00	10,293	76.43	3,174	23.57
Long Island Railroad	120,097	100.00	95,896	79.85	24,201	20.15
Total Passengers	192,243	100.00	160,817	83.65	31,426	16.35
Classified by Terminals						
Harlem River & 160th Street New York, Westchester & Boston Rwy.	13,467	100.00	10,293	76.43	3,174	23.57
Sedgwick Avenue Terminal New York Central Railroad	1,679	100.00	1,459	86.90	220	13.10
Grand Central Terminal						
New York Central Railroad	37,569	100.00	34,831	92.71	2,738	7.29
New York, New Haven & Hartford R.R.	19,431	100.00	18,338	94.37	1,093	5.63
Total Grand Central Terminal	57,000	100.00	53,169	93.28	3,831	6.72
Pennsylvania Station Long Island Railroad	71,261	100.00	67,655	94.91	3,626	5.09
Flatbush Avenue Terminal Long Island Railroad	46,552	100.00	28,118	60.40	18,434	39.60
Long Island City Terminal Long Island Railroad	2,264	100.00	123	5.43	2,141	94.57
Total Passengers	192,243	100.00	160,817	83.65	31,426	16.35

Source: Suburban Passenger Census, October 26, 1927.

DESTINATION ZONES OF MANHATTAN - BOUND PASSENGERS
WESTCHESTER AND LONG ISLAND SECTORS
Classified by Sectors
(160,817 Terminal Passengers with Destinations in Manhattan)

TABLE XII

Manhattan Zones	Combined Sectors.		Westchester Sector.		Long Island Sector.	
	Passengers	%	Passengers	%	Passengers	%
North of 62nd Street	4,497	2.81	1,988	3.06	2,509	2.62
62nd Street - 46th Street	7,703	4.79	4,507	6.94	3,196	3.33
46th Street - 39th Street	20,773	12.92	13,470	20.75	7,303	7.61
39th Street - 29th Street	7,797	4.85	3,503	5.40	4,294	4.48
29th Street - 17th Street	8,145	5.06	3,722	5.73	4,423	4.61
17th Street - 11th Street	3,043	1.89	1,249	1.92	1,794	1.87
11th Street - Charlton, Prince Streets	2,468	1.53	1,055	1.63	1,413	1.47
Charlton, Prince, Dunne, Roosevelt Streets	3,475	2.16	1,232	1.90	2,243	2.34
Dunne, Roosevelt-Vesey, Jeremiah Streets	4,132	2.57	1,446	2.23	2,686	2.80
Below Vesey, De Hanna Streets	25,394	15.79	9,336	14.38	16,058	16.75
Total West of Broadway & 5th Avenue	87,631	54.51	41,923	64.58	45,736	47.70
North of 62nd Street	6,218	3.93	1,974	3.04	4,344	4.53
62nd Street - 46th Street	7,615	4.74	2,994	4.61	4,621	4.82
46th Street - 39th Street	13,754	8.56	7,148	11.01	6,606	6.14
39th Street - 29th Street	5,420	3.37	2,110	3.25	3,310	3.45
29th Street - 17th Street	3,704	2.30	1,700	2.76	10,574	11.03
17th Street - 11th Street	3,133	1.95	1,092	1.68	2,041	2.12
11th Street - Charlton, Prince Streets	3,677	2.22	904	1.39	2,228	2.32
Charlton, Prince-Dunne, Roosevelt Streets	4,027	2.50	975	1.50	3,052	3.18
Dunne, Roosevelt-Vesey, Jeremiah Streets	11,704	7.28	3,068	4.76	8,636	8.96
Below Vesey, De Hanna Streets						
Total East of Broadway & 5th Avenue	73,156	45.49	22,998	35.42	50,158	52.30
North of 62nd Street	10,815	6.74	3,962	6.10	6,853	7.15
62nd Street - 46th Street	15,382	9.69	7,763	11.96	7,619	7.95
46th Street - 39th Street	34,527	21.47	14,961	30.72	14,756	15.39
39th Street - 29th Street	21,901	13.59	6,861	10.57	15,040	15.69
29th Street - 17th Street	13,665	8.43	5,512	8.49	8,153	8.50
17th Street - 11th Street	6,747	4.19	2,043	3.15	4,704	4.90
11th Street - Charlton, Prince Streets	5,601	3.46	1,960	3.02	3,641	3.79
Charlton, Prince-Dunne, Roosevelt Streets	7,052	4.38	2,136	3.29	4,916	5.13
Dunne, Roosevelt-Vesey, Jeremiah Streets	6,159	5.07	2,421	3.73	5,738	5.98
Below Vesey, Jeremiah Streets	37,096	23.07	12,424	19.14	24,674	25.73
Total Manhattan Zone	160,817	100.00	64,921	100.00	95,896	100.00

Source: Suburban Passenger Census, October 26, 1927.

DESTINATION ZONES OF MANHATTAN - BOUND PASSENGERS

WESTCHESTER AND LONG ISLAND SECTORS

(160,617 Terminal Passengers with Destinations in Manhattan)

Manhattan Zones	Suburban Passengers with Destinations in Manhattan.		New York Central Railroad		New York, New Haven & Hartford Railroad		New York, Westchester & Boston Railway.		Long Island Railroad	
	Passengers	%	Passengers	%	Passengers	%	Passengers	%	Passengers	%
North of 62nd Street	4,497	2.81	569	1.57	390	2.12	1,029	10.00	2,509	2.62
62nd Street - 46th Street	7,967	4.95	2,712	7.47	1,461	7.97	596	5.79	3,196	3.33
46th Street - 39th Street	20,773	12.92	9,084	24.87	3,549	19.35	1,852	18.16	6,948	7.25
39th Street - 29th Street	7,767	4.83	1,956	5.40	965	5.26	576	5.67	4,466	4.66
29th Street - 17th Street	8,145	5.06	2,144	5.90	995	5.43	563	5.56	4,423	4.61
17th Street - 11th Street	3,043	1.89	671	1.85	296	1.63	280	2.72	1,794	1.87
11th Street - Charlton, Prince Streets	2,466	1.53	517	1.42	216	1.19	320	3.12	1,413	1.47
Charlton, Prince-Dunne, Roosevelt Streets	3,475	2.16	551	1.52	388	2.12	295	2.85	2,243	2.34
Dunne, Roosevelt-Vesey, Beekman Streets	4,132	2.57	661	1.85	432	2.39	345	3.35	2,906	2.80
Below Vesey, Beekman Streets	25,394	15.79	4,994	13.76	3,154	17.36	1,188	11.25	16,058	16.75
Total East of Broadway & 5th Avenue	87,661	54.51	23,881	65.64	11,868	64.72	6,234	60.57	45,738	47.70
North of 62nd Street	6,318	3.93	716	1.97	392	2.14	866	8.40	4,344	4.53
62nd Street - 46th Street	7,615	4.74	1,675	4.62	922	5.03	397	3.86	4,621	4.82
46th Street - 39th Street	13,924	8.66	3,561	9.81	1,768	9.64	767	7.65	7,808	8.14
39th Street - 29th Street	13,734	8.54	1,842	5.06	814	4.44	504	4.90	10,574	11.03
29th Street - 17th Street	5,430	3.37	906	2.50	468	2.66	396	3.85	3,630	3.79
17th Street - 11th Street	3,704	2.30	661	1.79	291	1.53	190	1.55	2,012	2.72
11th Street - Charlton, Prince Streets	3,133	1.95	525	1.45	226	1.03	152	1.49	2,230	2.33
Charlton, Prince-Dunne, Roosevelt Streets	3,577	2.22	403	1.33	259	1.56	133	1.28	2,673	2.79
Dunne, Roosevelt-Vesey, Beekman Streets	4,027	2.50	523	1.44	231	1.26	221	2.15	3,052	3.18
Below Vesey, Beekman Streets	11,704	7.28	1,569	4.37	1,059	5.77	73	4.30	8,816	8.96
Total West of Broadway & 5th Avenue	73,156	45.49	12,469	34.36	6,470	35.28	4,059	39.43	50,158	52.30
North of 62nd Street	10,815	6.74	1,865	3.54	782	4.26	1,895	18.40	6,853	7.15
62nd Street - 46th Street	15,582	9.69	4,387	12.09	2,383	13.00	993	9.65	7,819	8.15
46th Street - 39th Street	34,697	21.58	12,645	34.66	5,317	28.99	2,619	19.81	14,756	15.29
39th Street - 29th Street	21,501	13.37	3,800	10.46	1,779	9.70	1,068	8.67	15,040	15.69
29th Street - 17th Street	13,565	8.43	3,050	8.40	1,463	8.09	979	9.51	8,053	8.40
17th Street - 11th Street	6,747	4.19	1,332	3.64	579	3.16	440	4.27	4,406	4.59
11th Street - Charlton, Prince Streets	5,601	3.48	1,043	2.87	444	2.42	473	4.61	3,641	3.79
Charlton, Prince-Dunne, Roosevelt Streets	7,052	4.38	1,034	2.85	677	3.70	425	4.13	4,916	5.13
Dunne, Roosevelt-Vesey, Beekman Streets	8,159	5.07	1,814	5.00	851	4.65	566	5.50	5,730	5.96
Below Vesey, Beekman Streets	37,098	23.07	6,980	19.23	4,243	23.13	1,501	15.55	24,974	25.73
Total Manhattan Zones	160,817	100.00	36,290	100.00	18,338	100.00	10,293	100.00	95,896	100.00

Source: Suburban Passenger Census, October 25, 1927.

DESTINATION ZONES OF MANHATTAN - BOUND PASSENGERS

WESTCHESTER AND LONG ISLAND SECTORS

Classified by Terminals

(160,617 Terminal Passengers with Destinations in Manhattan)

TABLE XIV

Manhattan Zones	Total Suburban Passengers for Manhattan		Harlem River & 125th Street		Sedgwick Avenue Terminal.		Grand Central Terminal		Pennsylvania Station		Flatbush Avenue Terminal		Long Island City Terminal	
	Passengers	%	Passengers	%	Passengers	%	Passengers	%	Passengers	%	Passengers	%	Passengers	%
North of 62nd Street	4,497	2.81	1,029	10.00	45	3.08	914	1.72	1,830	2.70	678	2.40	1	0.88
62nd Street - 46th Street	7,967	4.95	596	5.79	32	2.19	4,141	7.79	2,747	4.06	451	1.60	-	-
46th Street - 39th Street	20,773	12.92	1,852	18.16	36	2.60	12,535	23.58	5,656	8.66	961	3.49	111	99.24
39th Street - 29th Street	7,767	4.83	378	3.67	14	0.96	2,909	5.47	4,132	6.11	334	1.19	-	-
29th Street - 17th Street	8,145	5.06	563	5.66	18	1.23	3,121	5.87	3,774	5.56	669	2.21	-	-
17th Street - 11th Street	3,043	1.89	280	2.72	21	1.44	948	1.76	1,302	1.92	492	1.75	-	-
11th Street - Charlton, Prince Streets	2,466	1.53	320	3.12	15	1.04	780	1.51	911	1.25	508	1.79	-	-
Charlton, Prince-Dunne, Roosevelt Streets	3,475	2.16	293	2.85	20	1.37	919	1.73	998	1.48	1,245	4.43	-	-
Dunne, Roosevelt-Vesey, Beekman Streets	4,132	2.57	345	3.35	27	1.85	1,074	2.02	1,030	1.52	1,656	5.89	-	-
Below Vesey, Beekman Streets	25,394	15.79	1,158	11.25	201	13.78	7,977	15.00	5,076	7.50	10,968	39.06	-	-
Total East of Broadway & 5th Avenue	87,661	54.51	6,834	66.57	431	29.54	35,256	66.31	27,656	40.88	17,970	63.91	112	91.06
North of 62nd Street	6,318	3.93	866	8.40	238	16.32	670	1.64	3,966	5.89	356	1.27	-	-
62nd Street - 46th Street	7,615	4.74	397	3.85	106	7.41	2,489	4.66	4,220	6.24	401	1.43	-	-
46th Street - 39th Street	13,924	8.66	767	7.45	72	4.93	5,257	9.86	7,075	10.46	732	2.60	1	0.82
39th Street - 17th Street	13,734	8.54	504	4.90	89	6.10	2,567	4.83	10,010	14.80	554	1.97	10	8.12
29th Street - 11th Street	5,430	3.37	396	3.85	104	7.13	1,290	2.43	3,330	4.90	310	1.10	-	-
17th Street - 11th Street	3,704	2.30	160	1.55	87	5.96	645	1.59	2,151	3.18	461	1.64	-	-
11th Street - Charlton, Prince Streets	3,133	1.95	153	1.49	32	2.07	713	1.34	1,036	1.53	590	2.10	-	-
Charlton, Prince-Dunne, Roosevelt Streets	3,577	2.22	132	1.28	53	3.63	919	1.35	1,766	2.61	907	3.23	-	-
Dunne, Roosevelt-Vesey Beekman Streets	4,027	2.50	221	2.15	40	2.74	706	1.33	1,870	2.76	1,182	4.20	-	-
Below Vesey, Beekman Streets	11,704	7.28	443	4.30	190	13.02	2,455	4.62	3,963	5.86	4,653	16.55	-	-
Total West of Broadway & 5th Avenue	73,156	45.49	4,059	39.43	1,028	70.46	17,911	33.69	30,999	59.12	10,148	36.09	- 11	8.94
North of 62nd Street	10,815	6.74	1,895	18.40	283	19.40	1,704	3.36	5,816	8.59	1,036	3.67	1	0.82
62nd Street - 46th Streets	15,582	9.69	993	9.65	140	9.60	6,630	12.47	8,967	10.30	852	3.03	-	-
46th Street - 39th Street	34,697	21.58	3,039	19.81	110	7.53	17,792	33.46	12,931	19.12	1,713	6.09	112	91.06
39th Street - 17th Street	21,501	13.37	882	8.57	103	7.06	5,476	10.30	14,142	20.91	666	3.16	10	8.12
17th Street - 11th Street	13,565	8.43	979	9.51	122	8.36	4,411	8.30	7,094	10.49	959	3.41	-	-
11th Street - Charlton, Prince Streets	6,747	4.19	440	4.27	108	7.40	1,793	3.37	3,453	5.10	953	3.39	-	-
Charlton, Prince-Dunne, Roosevelt Streets	5,601	3.48	473	4.61	54	3.71	1,433	2.69	2,549	3.77	1,092	3.89	-	-
Dunne, Roosevelt-Vesey, Beekman Streets	7,052	4.38	425	4.13	73	5.00	1,630	3.06	2,764	4.09	2,152	7.66	-	-
Below Vesey, Beekman Streets	8,159	5.07	566	5.50	75	5.14	1,760	3.35	2,900	4.28	2,836	10.09	-	-
	37,098	23.07	1,001	15.56	391	26.80	10,432	19.62	9,039	13.36	15,635	55.61	-	-
Total Manhattan Zones	160,817	100.00	10,893	100.00	1,459	100.00	53,169	100.00	67,655	100.00	28,118	100.00	123	100.00

Source: Suburban Passenger Census, October 26, 1927.

FACILITIES USED FROM RAILROAD TERMINALS

WESTCHESTER AND LONG ISLAND SECTORS

Classified by Sectors, Railroads and Terminals
(192,243 Terminal Passengers on Suburban Trains)

TABLE XV

Sectors, Railroads and Terminals	FACILITY USED TO ULTIMATE DESTINATION																									
	West Side Lines		East Side Lines		B.M.T. Subway		Shuttle		Vanderbilt Subway	H. & M. Tubes		Street Car		Bus		Taxi		Walk		2nd Ave. Elevated		3rd Ave. Elevated		6th Ave. Elevated		9th Ave. Elevated		Total	
	Pass.	%	Pass.	%	Pass.	%	Pass.	%	Pass	%	Pass	%	Pass.	%	Pass.	%	Pass.	%	Pass.	%	Pass.	%	Pass.	%	Pass.	%	Pass.	%
Classified by Sectors																										
Combined Sectors	54,454	28.33	37,185	19.34	15,719	8.18	3,090	1.61	930	0.48	952	0.51	12,503	6.50	1,704	0.89	2,433	1.27	54,404	28.30	1,136	0.56	4,722	2.46	1,413	0.73	1,598	0.82	192,243	100.00
Westchester Sector	5,490	7.61	20,047	27.79	1,276	1.77	2,195	3.04	718	0.99	156	0.22	6,219	8.62	672	0.92	1,270	1.76	26,461	36.66	1,981	1.50	4,658	6.46	720	1.00	1,185	1.64	72,146	100.00
Long Island Sector	48,964	40.77	17,138	14.27	14,441	12.02	895	0.75	212	0.18	796	0.66	6,284	5.23	1,032	0.86	1,163	0.97	27,943	23.27	55	0.05	64	0.05	693	0.58	413	0.34	120,097	100.00
Classified by Railroads																										
N.Y.C.R.R.	2,594	6.81	11,261	28.69	541	1.30	1,354	3.45	464	1.23	95	0.24	3,047	7.76	374	0.95	608	1.55	16,848	42.93	61	0.16	292	0.74	572	1.46	1,117	2.85	39,248	100.00
N.Y.N.H. & H.R.R.	1,639	8.43	6,404	32.96	446	2.30	811	4.17	216	1.12	39	0.20	1,500	7.72	271	1.39	543	2.79	7,272	37.46	31	0.16	139	0.72	86	0.44	27	0.14	19,431	100.00
N.Y.W. & B. Rwy.	1,257	9.33	2,302	17.09	291	2.16	30	0.22	12	0.09	24	0.18	1,672	12.42	27	0.21	119	0.88	2,334	17.33	969	7.34	4,227	31.39	62	0.46	41	0.30	13,467	100.00
Long Island R.R.	48,964	40.77	17,138	14.27	14,441	12.02	895	0.75	212	0.18	796	0.66	6,284	5.23	1,032	0.86	1,163	0.97	27,943	23.27	55	0.05	64	0.05	693	0.58	413	0.34	120,097	100.00
Total	54,454	28.33	37,185	19.34	15,719	8.18	3,090	1.61	930	0.48	952	0.51	12,503	6.50	1,704	0.89	2,433	1.27	54,404	28.30	1,136	0.56	4,722	2.46	1,413	0.73	1,598	0.82	192,243	100.00
Classified by Terminals																										
Harlem River & 180th St. N.Y.W. & B. Rwy.	1,257	9.33	2,302	17.09	291	2.16	30	0.22	12	0.09	24	0.18	1,672	12.42	27	0.21	119	0.88	2,334	17.33	969	7.34	4,227	31.39	62	0.46	41	0.30	13,467	100.00
Sedgwick Ave. Terminal N.Y.C.R.R.	41	2.44	47	2.80	-		-		-		2	0.12	73	4.35	-		-		75	4.47	2	0.12	5	0.30	366	22.99	1,048	62.41	1,679	100.00
Grand Central Terminal N.Y.C.R.R.	2,553	6.60	11,214	29.04	541	1.43	1,354	3.60	464	1.29	93	0.25	2,974	7.92	374	1.00	608	1.62	16,773	44.65	59	0.16	287	0.76	186	0.50	69	0.18	37,569	100.00
N.Y.N.H. & H.R.R.	1,639	8.43	6,404	32.96	446	2.30	811	4.17	216	1.12	39	0.20	1,500	7.72	271	1.39	543	2.79	7,272	37.46	31	0.16	139	0.72	86	0.44	27	0.14	19,431	100.00
Total Grand Central Terminal	4,192	7.32	17,618	30.71	987	1.73	2,165	3.80	680	1.18	132	0.23	4,474	7.85	645	1.13	1,151	2.02	24,045	42.20	90	0.16	426	0.75	272	0.48	96	0.17	57,000	100.00
Pennsylvania Station Long Island Railroad	33,024	46.33	2,424	3.40	9,866	9.66	791	1.11	128	0.18	691	0.97	2,744	3.85	941	1.32	1,006	1.41	21,513	30.18	50	0.07	50	0.07	670	0.94	364	0.51	71,281	100.00
Flatbush Ave. Terminal Long Island Railroad	15,930	34.82	14,827	31.42	7,496	16.09	60	0.13	26	0.06	84	0.18	3,021	6.49	61	0.13	156	0.34	5,009	10.76	50	0.01	14	0.03	23	0.05	42	0.09	46,552	100.00
Long Island City Terminal Long Island Railroad	10	0.44	87	3.84	65	2.87	44	1.94	62	2.74	19	0.84	519	22.92	30	1.33	-		1,421	62.77	-		-		-		7	0.31	2,264	100.00
Total Terminal Passengers on Suburban Trains	54,454	28.33	37,185	19.34	15,719	8.18	3,090	1.61	930	0.48	952	0.51	12,503	6.50	1,704	0.89	2,433	1.27	54,404	28.30	1,136	0.56	4,722	2.46	1,413	0.73	1,598	0.82	192,243	100.00

Source: Suburban Passenger Census, October 26, 1927.

FACILITIES USED FROM RAILROAD TERMINALS

WESTCHESTER AND LONG ISLAND SECTORS

Classified by Sectors, Railroads and Terminals
(192,243 Terminal Passengers on Suburban Trains)

TABLE XVI

Sectors, Railroads and Terminals.	Below Street Level						Street Level										Above Street Level		Total Passengers	
	Subway		H. & M.		Total		Walk		Street Car		Bus		Taxi		Total		Elevated Railway			
	Passengers	%	Pass.	%	Passengers	%	Passengers	%	Passengers	%	Pass.	%	Pass.	%	Passengers	%	Pass.	%	Passengers	%
Classified by Sectors																				
Combined Sectors	111,378	57.94	952	0.49	112,330	58.43	54,404	28.30	12,503	6.50	1,704	0.88	2,433	1.28	71,044	36.96	8,869	4.61	192,243	100.00
Westchester Sector	29,722	41.20	158	0.22	29,880	41.42	26,461	36.68	6,219	8.62	672	0.93	1,270	1.76	34,622	47.99	7,644	10.59	72,146	100.00
Long Island Sector	81,656	67.99	794	0.66	82,450	68.65	27,943	23.27	6,284	5.23	1,032	0.86	1,163	0.97	36,422	30.33	1,225	1.02	120,097	100.00
Classified by Railroads																				
N.Y.C.R.R.	16,234	41.36	95	0.24	16,329	41.60	16,848	42.93	3,047	7.76	374	0.95	608	1.55	20,877	53.19	2,042	5.21	39,248	100.00
N.Y.N.H. & H.R.R.	9,516	48.97	39	0.20	9,555	49.17	7,272	37.46	1,500	7.72	271	1.39	543	2.79	9,593	49.37	283	1.46	19,431	100.00
N.Y.W. & B.Rwy. Co.	3,972	29.49	24	0.18	3,996	29.67	2,334	17.33	1,672	12.42	27	0.20	119	0.88	4,152	30.83	5,319	39.50	13,467	100.00
Long Island R.R.	81,656	67.99	794	0.66	82,450	68.65	27,943	23.27	6,284	5.23	1,032	0.86	1,163	0.97	36,422	30.33	1,225	1.02	120,097	100.00
Total	111,378	57.94	952	0.49	112,330	58.43	54,404	28.30	12,503	6.50	1,704	0.88	2,433	1.28	71,044	36.96	8,869	4.61	192,243	100.00
Classified by Terminals																				
Harlem R. & 180th St. N.Y.W. & B. Rwy. Co.	3,972	29.49	24	0.18	3,996	29.67	2,334	17.33	1,672	12.42	27	0.20	119	0.88	4,152	30.83	5,319	39.50	13,467	100.00
Sedgwick Ave. Term. N.Y.C.R.R.	88	5.24	2	0.13	90	5.37	75	4.47	73	4.34	-		-		148	8.81	1,441	85.82	1,679	100.00
Grand Central Term. N.Y.C.R.R.	16,146	42.98	93	0.24	16,239	43.22	16,773	44.65	2,974	7.92	374	1.00	608	1.61	20,729	55.18	601	1.60	37,569	100.00
N.Y.N.H. & H.R.R.	9,516	48.97	39	0.20	9,555	49.17	7,272	37.46	1,500	7.72	271	1.39	543	2.79	9,593	49.37	283	1.46	19,431	100.00
Total Grand Central	25,662	45.02	132	0.23	25,794	45.25	24,052	42.20	4,474	7.85	645	1.13	1,151	2.02	30,322	53.20	884	1.55	57,000	100.00
Penna. Station Long Island R.R.	43,253	60.68	691	0.97	43,944	61.65	21,513	30.18	2,744	3.85	941	1.32	1,006	1.41	26,203	36.76	1,134	1.59	71,281	100.00
Flatbush Ave. Term. Long Island R.R.	36,135	81.92	84	0.18	36,219	82.10	5,009	10.76	3,021	6.49	61	0.13	156	0.34	8,249	17.72	84	0.18	46,552	100.00
Long Island City Term. Long Island R.R.	256	11.64	19	0.83	287	12.67	1,421	62.77	519	22.92	30	1.32	-		1,970	87.01	7	0.32	2,264	100.00
Total Term. Passengers on Suburban Trains.	111,378	57.94	952	0.49	112,330	58.43	54,404	28.30	12,503	6.50	1,704	0.88	2,433	1.28	71,044	36.96	8,869	4.61	192,243	100.00

Source: Suburban Passenger Census, October 26, 1927.

MAXIMUM 60 MINUTE PASSENGER LOAD ON RAILROAD TERMINALS.

NEW JERSEY SECTOR.

TABLE XVII

Terminals and Railroads	Maximum 60 Minute Period	Passengers	Total Passengers 24 Hours	Rush Hour Percent of 24 Hours.
C.R.R. Terminal, Jersey City				
Baltimore & Ohio R.R.	7:46-8:45 A.M.	141	761	18.50
Central Railroad, N.J.	8:01-9:00 A.M.	11,072	25,233	43.88
Total for Terminal	8:01-9:00 A.M.	11,072	25,994	42.59
L. I. & W. Terminal, Hoboken				
D. L. & W. R.R.	8:01-9:00 A.M.	18,168	32,794	55.40
Erie Terminal, Jersey City				
Erie Railroad	7:46-8:45 A.M.	26,696	49,528	53.90
H. & M. Manhattan Terminals				
Hudson Terminal	8:01-9:00 A.M.	28,068	106,782	26.29
Up-town Stations	8:01-9:00 A.M.	15,443	61,092	25.28
Total for Terminals	8:01-9:00 A.M.	43,511	167,874	25.92
Penn. Sta. New York City				
Pennsylvania R.R.	7:46-8:45 A.M.	5,663	17,752	31.90
Lehigh Valley R.R.	8:31-9:30 A.M.	225	769	29.30
Total Penn. Sta., N.Y.C.	7:46-8:45 A.M.	5,879	18,521	31.74
Penn. Sta. Jersey City				
Pennsylvania R.R.	7:46-8:45 A.M.	1,913	5,998	31.90
Lehigh Valley R.R.	8:31-9:30 A.M.	106	363	29.30
Total Penn. Sta., J. C.	7:46-8:45 A.M.	2,015	6,361	31.68
Weehawken Terminal				
West Shore R.R.	7:46-8:45 A.M.	6,343	13,729	46.20
N.Y., O. & W.R.R.	2:01-3:00 P.M.	276	853	32.40
Total for Terminal	7:46-8:45 A.M.	6,343	14,582	43.50

Source: Census of September 24, 1924.
Annual Traffic Data.

MAXIMUM 60 MINUTE PASSENGER LOAD ON NEW YORK CITY TERMINALS.

WESTCHESTER AND LONG ISLAND SECTORS.

TABLE XVIII

Terminals and Railroads	Maximum 60 Minute Period.	Passengers	Total Passengers 24 Hours	Rush Hour Percent of 24 Hours.
Westchester Sector.				
Grand Central Terminal				
N.Y.C.R.R.	8:04-9:03 A.M.	20,170	37,569	53.69
N.Y., N.H. & H.R.R.	8:24-9:23 A.M.	9,976	19,431	51.34
Total G.C.T.	8:10-9:09 A.M.	29,051	57,000	50.97
Harlem River Terminal				
N.Y.W. & B.R.R.	7:45-8:44 A.M.	* 3,552	#13,467	26.38
Sedgwick Avenue Terminal				
N.Y.C.R.R.	7:56-8:55 A.M.	806	1,679	48.00
Long Island Sector.				
Pennsylvania Station				
Long Island R.R.	7:50-8:49 A.M.	28,299	71,261	39.70
Flatbush Avenue Terminal				
Long Island R.R.	7:30-8:29 A.M.	16,662	46,552	35.79
Long Island City Terminal				
Long Island R.R.	7:38-8:37 A.M.	1,454	2,264	64.22

* Includes 952 passengers transferring at 180th Street.
\# Includes 4,825 passengers transferring at 180th Street.

Source: Suburban Passenger Census, October 26, 1927.

APPENDIX B

ANNUAL TRAFFIC TABLES

TABLE XIX

GROWTH OF TOTAL RAILROAD TRAFFIC
IN THE
NEW YORK METROPOLITAN DISTRICT

Increase of Each Year Over Preceding Year

Year	Passengers	Difference	% Increase Over Preceeding Year
1911	181,848,738		
		1,636,127	0.90%
1912	183,484,865		
		8,514,841	4.64
1913	191,999,706		
		130,043	0.07
1914	192,129,749		
		3,872,220	2.02
1915	196,002,969		
		18,431,710	9.40
1916	214,434,679		
		16,039,633	7.48
1917	230,474,312		
		11,364,785	4.93
1918	241,839,097		
		36,375,595	15.04
1919	278,214,692		
		21,998,397	7.91
1920	300,213,089		
		4,922,984	1.64
1921	305,136,073		
		10,314,019	3.38
1922	315,450,092		
		16,384,309	5.19
1923	331,834,401		
		12,365,644	3.73
1924	344,200,045		
		14,646,289	4.26
1925	358,846,334		
		8,730,912	2.43
1926	367,577,246		
		13,225,262	3.60
1927	380,802,508		
		1,985,393	0.52
1928	382,787,901		

Source: Statistics supplied by the various railroads.

TABLE XX

TOTAL RAILROAD PASSENGERS
IN THE
NEW YORK METROPOLITAN DISTRICT
Classified by Sectors
1911 - 1928

Year	New Jersey Sector	Westchester Sector	Long Island Sector	Combined Sectors
1911	126,293,695	21,687,815	33,867,228	181,848,738
1912	122,735,733	23,429,320	37,319,812	183,484,865
1913	124,868,587	26,524,936	40,606,183	191,999,706
1914	122,965,356	27,530,170	41,634,223	192,129,749
1915	123,980,010	29,393,634	42,629,325	196,002,969
1916	133,819,355	34,812,602	45,802,722	214,434,679
1917	142,190,797	37,487,487	50,796,028	230,474,312
1918	151,185,882	35,649,129	55,004,086	241,839,097
1919	175,708,250	38,438,901	64,067,541	278,214,692
1920	182,140,059	45,329,210	72,743,820	300,213,089
1921	184,334,378	45,285,650	75,506,045	305,136,073
1922	189,602,662	46,190,539	79,656,891	315,450,092
1923	197,240,187	48,427,318	86,166,896	331,834,401
1924	200,398,989	50,810,046	92,991,010	344,200,045
1925	204,212,538	53,710,983	100,922,813	358,846,334
1926	205,839,674	56,943,350	104,794,222	367,577,246
1927	208,562,914	60,586,261	111,653,333	380,802,508
1928	207,143,258	63,098,052	112,546,591	382,787,901

Source: Statistics Supplied by the Various Railroads.

COMPARATIVE CHANGES IN VOLUME OF PASSENGER TRAFFIC
Total Class I Railroads of the United States
and Passenger Railroads of the New York Metropolitan Area

TABLE XXI

Year	(a) Total Class I Railroads of the United States	(b) Total Passenger Railroads New York Metropolitan Area
1911	938,655,719	181,848,738
1912	944,265,173	183,484,865
1913	983,692,468	191,999,706
1914	1,002,350,385	192,129,749
1915	936,368,539	196,002,969
1916	978,154,663	214,434,679
1917	1,066,638,474	230,474,312
1918	1,084,997,896	241,839,097
1919	1,177,820,454	278,214,692
1920	1,234,862,048	300,215,089
1921	1,035,496,329	305,136,073
1922	967,409,205	315,450,092
1923	986,913,075	331,834,401
1924	932,678,462	344,200,045
1925	888,267,296	358,846,334
1926	862,361,333	367,577,246
1927	829,917,845	380,802,508
1928	790,327,447	382,787,901

Source: (a) Interstate Commerce Commission's Reports
(b) Statistics Supplied by the Various Railroads

COMPARISON OF GROWTH OF RAILROAD PASSENGERS, POPULATION AND REGISTRATIONS
OF PASSENGER AUTOMOBILES IN THE U. S. A. 1900 - 1928 (inclusive)

TABLE XXII

Year	# Total Railroad Passengers in U.S.A. Class 1 Railroad Passengers in U.S.A.	Population of the U. S. A. according to Federal Census Reports	Passenger Automobile Registered in the U. S. A.
1900	576,831,251	75,994,575	8,000
1901	607,278,121		14,800
1902	649,878,505		23,000
1903	694,891,535		32,920
1904	715,419,682		54,590
1905	738,834,987		77,400
1906	797,946,116		105,900
1907	873,905,133		140,300
1908	890,009,574		194,400
1909	891,472,425		305,950
1910	971,683,199	91,972,266	458,500
1911	997,409,882		
1911	938,655,719		619,500
1912	944,265,173		902,600
1913	983,692,468		1,194,222
1914	1,002,350,385		1,625,739
1915	936,368,539		2,309,666
1916	978,154,663		3,297,996
1917	1,066,638,474		4,657,340
1918	1,084,997,896		5,821,617
1919	1,177,820,454		6,771,974
1920	1,234,862,048	105,710,620	8,225,859
1921	1,035,496,329		9,346,195
1922	967,409,205		10,864,128
1923	986,913,075		13,479,608
1924	932,678,462		15,480,649
1925	888,267,296		17,512,638
1926	862,361,333		19,237,171
1927	829,917,845		20,219,224
1928	790,327,447	120,013,000 *	21,379,125
1929			
1930			

* Estimated by Department of Commerce, using available data on births, deaths, immigration and emigration.

\# Railroads of U.S.A. grouped geographically until 1911; from 1911 classed by financial status; Class I denotes railroads whose operating revenues amount to a million dollars or more each year.

Sources: RAILROAD PASSENGERS from Interstate Commerce Commission Reports.
POPULATION from Federal Census Reports.
REGISTRATIONS OF PASSENGER AUTOMOBILES from National Automobile Chamber of Commerce.

COLUMBIA UNIVERSITY LIBRARIES

This book is due on the date indicated below, or at the expiration of a definite period after the date of borrowing, as provided by the library rules or by special arrangement with the Librarian in charge.

DATE BORROWED	DATE DUE	DATE BORROWED	DATE DUE
Feb3 58			

C28(10-53)100M

COLUMBIA UNIVERSITY LIBRARIES

0021294372

END OF
TITLE